American Journal of Public Health

And *The Nation's Health*

Volume 24 — April, 1934 — Number 4

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Sixty-Third Annual Meeting, Pasadena, September 3-6, 1934
Headquarters: Maryland Hotel, and Huntington Hotel

Published by the

American Public Health Association

374 Broadway, Albany, N. Y.

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Presented at the Sixty-second Annual Meeting at Indianapolis, October 10, 1933

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American Journal of Public Health
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Volume 24 April, 1934 Number 4

Methods for the Microbiological Analysis of Butter*

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DURING the past few years the routine analysis of butter for yeasts, molds, and bacteria has increased, due no doubt to the widening application it has as an index to sanitary conditions and the efficiency of the manufacturing processes in the creamery. Because of this interest there was appointed in the American Dairy Science Association a committee to study the methods used and with the hope that they could suggest what later would develop into a standard procedure. This committee consisted of Dr. B. W. Hammer of the Iowa State College, Dr. E. G. Hood of the Dairy Research Laboratories of the Dominion of Canada, Dr. H. Macy of the University of Minnesota, and myself as chairman. The first work of this committee was to get together the existing methods and study them, and a report was issued on this work in 1930.[5] Three years later [6] another report was issued, and those who have read these two reports have noted changes. These changes were a result of experimentation. Another objective that this committee has been mindful of is to suggest those procedures which will give only the truest microbiological analysis, and it has, as far as possible, kept the number of suggestions as to methods at a minimum, realizing that the fewer the more likelihood of uniformity. An insight into some of the research done by this committee and its associates may improve your laboratory practice, and the committee will also appreciate aid in perfecting these methods. Methods of sampling and care of samples prior to analysis are omitted from this discussion, for there has been but little controversy as to these methods suggested in 1930.

Of the routine analysis made on butter, probably the most common is the determination of the number of yeasts and molds. The number of yeasts and molds in butter reflects the efficiency of pasteurization—for proper pasteurization destroys most of the yeasts and all of the molds—and the sanitary conditions under which the butter is manufactured. Improperly cleansed and sterilized equipment gives high yeast and mold content. Standards as to numbers of yeasts and molds to be

* Read before the Laboratory Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 12, 1933.

TABLE I

COUNTS OF YEAST COLONIES FROM BUTTER SAMPLES ON MEDIA OF DIFFERENT pH VALUES

Sample	*pH 3.0*	*3.4*	*3.8*	*4.2*	*4.6*
2	142	156	179	189	183
6	131	156	179	144	135
10	95	81	69	83	99
20	132	133	133	147	124
23	286	410	440	462	445
27	17	46	42	39	52
30	236	217	241	252	291
34	165	187	179	189	186
38	13	28	28	32	28
43	193	302	288	307	290
53	112	132	121	130	124

allowed in butter have been suggested, and in Canada a score card for grading butter is used which allows points if the number of yeasts and molds is below a definite number. The technic of making this count had not been studied in detail until a few years ago.

In 1928, Hood and White[1] made a study of the various methods used to determine the number of yeasts and molds in butter. They studied 8 media and found that the pH used by different workers varied from pH 3.5 to 4.6. The counts secured on the media adjusted to pH 4.6 were much higher than those on the media adjusted to pH 3.5, the probable reason being that at pH 4.6 many bacterial colonies developed and these were counted as yeasts, since subsurface yeast colonies are difficult to differentiate from bacterial colonies. The media used were supposed to be specific for yeasts and molds.

The evidence secured indicated that a pH of 3.5 was necessary if one was to be reasonably assured that all bacterial colonies were to be inhibited. The question arose as to whether pH 3.5 would not be inhibitive to some yeasts and molds. White and Hood[2] made a study of 63 representative yeast cultures secured from a wide range of Canadian butters, and found that their growth on malt agar was not adversely affected at a pH range of 3.4 to 4.6. In the study of the effect of pH on the yeast count of butter they procured somewhat similar though not quite identical results.

The general trend, as shown in Table I, was that the number of colonies decreased as the acidity of the medium increased, though the variations in yeast and mold counts at pH 3.4 to 4.6 are not great enough to be of practical significance in routine analysis of butter.

Hood and White used in this work dehydrated malt agar, Difco. The American investigators had used whey agars prepared in two different ways, rennet and by acid coagulation. Parfitt[3] made a comparison of 9 media all of which had been used and recommended for the determination of yeasts and molds in butter. The media were acidulated to pH 3.5 with lactic acid and it was found that the whey agars prepared in the laboratory were quite inferior to other media in obtaining the maximum counts of yeast and mold.

TABLE II

LOG AVERAGE YEAST AND MOLD COUNT OF 32 BUTTERS

Media	*Yeasts and Molds per c.c.*
Whey agar rennet coagulation	712
Whey agar acid coagulation	2,172
Whey agar dehydrated	3,831
Standard nutrient agar +5% dextrose	2,130
Wort agar dehydrated	3,684
Malt agar dehydrated	3,164

The other 3 media studied, standard nutrient agar, standard nutrient agar plus 1 per cent lactose, and infusion agar plus 1 per cent lactose, yielded higher counts than whey agar prepared by rennet coagulation, but did not support as many colonies as the dehydrated wort or malt agar.

It was of particular interest to know why the whey agars did not yield as high counts as the dehydrated agars. In all probability the natural habitat of these yeasts and molds is in milk or cream, for they are associated with dirty churns and other improperly cleansed equipment. There appeared to us two possibilities,—the buffer capacity of the medium and the oxidation reduction potential intensity of the medium. If we considered the buffer capacity of the whey media it was found that those media which required large amounts of lactic acid in order to bring them from pH 6.8 to 3.5 supported the least number of colonies.

TABLE III

CUBIC CENTIMETERS OF N LACTIC ACID TO ADJUST 100 C.C.

Whey—rennet coagulation	11.0
Whey—acid coagulation	6.5
Whey—dehydrated	2.0

Experimenting later with tomato juice agar, it was found to yield counts equivalent to those media which required but 2.0 c.c. of N. lactic acid to adjust them, but tomato juice agar required about 18 c.c. of lactic acid to adjust it from 6.8 to pH 3.5. Thus it appears that the limiting factor is not the buffer capacity of the medium.

TABLE IV

MEAN YEAST AND MOLD COUNT OF 39 BUTTERS

Media	*Yeasts and Molds per c.c.*
Potato dextrose agar	218
Tomato agar	225
Wort agar	179
Standard nutrient agar +2% dextrose	150

Work is in progress to determine if the oxidation reduction potential of the medium is the limiting factor.

From the results so far secured it is indicated that the dehydrated media gave the highest counts. In seeking a medium which could be prepared in the laboratory easily, and after trying several, potato dextrose agar was found to yield satisfactory results. White and Hood had used dehydrated potato dextrose agar with good success but did not recommend it because of expense.

These counts indicate that tomato juice agar is slightly superior to potato dextrose agar but not enough to justify the additional trouble and expense. Tabulating the counts of these 39 butters in the order of their placings, the same conclusions are found as from the geometric means.

TABLE V

DISTRIBUTION OF BUTTERS

	1	*2*	*3*	*4*
Potato	14	6	8	4
Tomato	10	14	5	3
Wort	6	7	14	3
Standard + 1% dextrose	8	9	6	9

7 butters 0 count

Potato dextrose agar gives a clear medium, and is easily prepared, requiring only potatoes and commercial dextrose. The yeast colonies are large and if brom-phenol-blue is used in place of electrometer measurements to adjust pH, the medium does not have a color which makes it difficult to adjust to the yellow green of pH 3.5. This point should be emphasized, for with malt and wort agars considerable difficulty is experienced in adjusting the medium. It has been found good practice to add 0.5 c.c. of a 0.75 per cent solution of brom-phenol-blue to the media not only to assure correct adjustment, but because yeast colonies absorb the dye, making counting much easier and reducing the number of unsatisfactory

TABLE VI

INFLUENCE OF TEMPERATURE AND LENGTH OF INCUBATION TIME ON YEAST COUNT CULTURE

Culture No.	25° C.		30° C.		37° C.	
	48 hrs.	5 days	48 hrs.	5 days	48 hrs.	5 days
1	466	483	479	487	455	463
6	253	460	246	251	0	0
9	169	171	145	171	0	0
10	89	92	65	68	9	10
12	295	296	269	279	0	0
15	155	168	124	155	0	0
19	120	121	135	135	139	145
21	260	267	273	285	0	0

plates due to over growing of the plate by molds.

A study has been made of tartaric, citric, hydrochloric and sulphuric acids, and it has been found that the acid used in adjusting the pH of 3.5 is a factor in the growth of yeasts and molds. The results indicate that equally as high counts are obtained with tartaric than with the other acids. An objection was found to the acids studied other than tartaric—that as the yeast and mold colonies developed they neutralized the acid, raising the pH. If an indicator such as brom-phenol-blue is put into the medium this change becomes very apparent. These organisms neutralized citric acid more rapidly than lactic and lactic more rapidly than hydrochloric or sulphuric, and tartaric the least. This point is of importance because, in plates which contain large numbers of yeast and mold colonies, there the chance is afforded for bacteria to grow due to the increased pH.

From a group of malt agar plates which had been incubated 5 days at 21° C. 18 plates were selected, 6 heavily seeded, 6 containing between 100 and 300 colonies and 6 containing less than 100 colonies. The media had been adjusted to pH 3.5 at the time of pouring with lactic acid. At the conclusion of the incubation period the pH was again determined using a quinhydrone electrode, on the plates, with the following results:

Check Plates	*pH 3.50*
Heavily seeded	4.51
Medium seeded	3.96
Lightly seeded	3.77

Plates acidulated with tartaric acid did not show the same decrease of pH as did the other acids.

The incubation temperature for yeasts and molds suggested in the committee's report is 21° or 25° C. for 5 days. This recommendation is based upon the work of Hood and White[2] who found that 25° C. for 5 days gave the highest counts. A part of their results is given in Table VI.

While it is to be noted that in most of the samples little difference was found in the 48 hours' and 5 days' count there was a noticeable difference in colony size.

The author's comments on colony size is as follows:

> In the majority of cases the yeast colonies were very small after only 48 hours' incubation, and it was necessary to use a hand lens if all colonies were to be included. With some cultures, principally the pink yeasts, the colonies were large enough to count with the naked eye after 48 hours. At 5 days, however, all colonies from each culture were sufficiently large to be counted with the naked eye.

In the routine analysis of butter the total bacterial count has not had the usage that the total bacterial count in milk has had, due to the fact that starters or butter cultures are frequently used in the manufacture of butter and

by their addition to the cream the count is greatly increased and its significance becomes valueless. There are occasions, however, when total bacterial count is desired and the unpublished work of A. H. White shows that the medium yielding the highest counts was infusion agar with the addition of 1 per cent lactose. This investigator obtained equally as satisfactory results when using Bacto beef as when using infusion agar, and the Bacto product is much the easier to prepare. No comparative counts have been made using tomato juice agar or yeast extract agar for the total count.

In studying some of the specific defects in butter due to the action of microörganisms the total count is very helpful, especially if correlated with an incubation of the butter itself to determine if the defect can be intensified. It is therefore essential to use a medium that will support a satisfactory growth of most of the microörganisms. For butters made without starter, much could be determined about the methods of manufacture and the probable keeping quality if the kinds of bacteria present are determined. There are two groups of microörganisms which are the most important from the standpoint of keeping quality—the proteolytic and the lipolytic.

The determination of the proteolytic and lipolytic groups of bacteria would hardly be advisable for routine work, but frequently those in laboratories are called upon to determine the cause of a specific defect. Among butter defects caused by microörganisms are the breakdown of the protein (proteolysis) and hydrolysis of the fat (rancidity).

For the determination of members of proteolytic bacteria in butter there are suggested two methods: (1) the picking of contiguous colonies and inoculating into skimmed milk; (2) direct counting, using a medium containing casein. These two methods are at this time suggestive, and considerably more work is needed in the making of comparisons. Probably the simplest method of determining the proteolytic types is the addition of approximately 0.5 ml. of skimmed milk to the plate just prior to pouring, infusion agar being used as a base; proteolysis is detected by a clearing around the colony. Experience is necessary to differentiate clearing due to acidity or proteolysis. It is advisable when in doubt to flood the plates with 10 per cent hydrochloric acid solution, and if the clearing remains it denotes true proteolysis. The media suggested by Frazier and Rupp[4] has given successful results, but there is need for more investigational work. It may be of interest to know that about a year ago the Dairy Research Committee of the Empire Marketing Board drew up a set of methods for the microbiological analysis of butter. These methods were very similar to those suggested in this country and the two committees had worked independently of each other. Their recommendations on proteolytic bacteria are of interest. They suggest the gelatine plate for the determination of liquefaction and skimmed milk agar consisting of 1.5 per cent agar plus 10 per cent skimmed milk. This latter medium would meet with the approval of those who feel that the addition of peptone and other readily digestible nitrogenous substances permits protein digesting bacteria to grow without producing the clear-cut proteolytic zone.

For the detection of those organisms which hydrolyze milk fat the method suggested is one which utilizes the dye nile-blue sulphate. An emulsion (agar, water, and milk fat) is made, to which is added nile-blue sulphate and this is added to infusion agar. The milk fat globules are dyed pink which if hydrolyzed are turned to a blue. Care should be taken not to confuse absorption of the dye by the colony as hy-

drolysis for occasionally it will be found that some colonies absorb the dye and become blue.

MICROSCOPIC METHODS

The technic worked out by Hammer and Nelson and reported in *Research Bulletin No. 137* of the Iowa State Agricultural Experiment Station is well known and needs no comment. This technic is very valuable in appraising the keeping quality of a butter, and in knowing something of the flora it contains. Microscopic methods have many advantages over cultural methods and too frequently the laboratory technician leans too heavily upon the cultural, where so many factors must be controlled in order to get a correct analysis.

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Nutritive Value of Boiled and Raw Milk in Infant Feeding

WHILE there is considerable material which has been summarized by various writers concerning the absorption of the various food constituents in milk, there are few exact data regarding the influence of sterilization on the nutritive value of milk when fed to the infant.

Two healthy infants, 8 and 7 months old respectively, were fed on a measured amount of boiled cow's milk for 10 to 14 days, during the last 7 of which, the excreta were collected. The same procedure was followed with raw milk for a fortnight. Aliquot samples of milk were collected for analysis each day during the two periods, and the intake and output of nitrogen, fat, calcium, and phosphorus in each of the 7-day periods were determined and the retention of each calculated.

The authors conclude from their results, as far as they go, ". . . there is no evidence to support the idea that the boiling of milk interferes with its usefulness as a food for infants."—Noah Morris, M.D., and Stanley Graham, M.D., *Lancet,* Dec. 9, 1933, p. 1314.

Cough Plate Examinations for B. Pertussis*

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THIS paper is a report on one phase of a more general study of the problem of whooping cough control in Grand Rapids, a city of 176,700 population. To be convinced of the importance of such a study in as many centers as possible, it is only necessary to consult morbidity and mortality statistics. Approximately 6,000 deaths from whooping cough are reported every year in the United States. Most of them are among children under 5 years. The importance of whooping cough as a cause of death in this age group is well illustrated by figures taken from reports of the Bureau of Records and Statistics of the Michigan Department of Health.

TABLE I

MICHIGAN DEATHS IN CHILDREN UNDER 5 YEARS
COMPARISON OF COMMUNICABLE DISEASES

1929	*1930*	*1931*	*1932*
250 Whooping cough	186 Measles	183 Whooping cough	193 Whooping cough
211 Diphtheria	171 Whooping cough	151 Tuberculosis	139 Measles
185 Tuberculosis	162 Tuberculosis	70 Diphtheria	111 Tuberculosis
111 Measles	122 Diphtheria	42 Scarlet fever	40 Diphtheria
72 Scarlet fever	53 Scarlet fever	17 Measles	37 Scarlet fever

If whooping cough eventually is brought under control, it will be due to a number of factors—including, no doubt, an earlier diagnosis of the disease and the finding of more cases that occur, conscientious reporting by physicians, adequate isolation of infective cases by health departments, and the development and appropriate use of specific agents for its prevention. Our larger problem, therefore, falls naturally into several divisions, and includes: (1) an attempt to determine the practicability and value of maintaining a continuous cough plate diagnostic service in a community such as this; (2) an analysis of the applicability of the results of such a service in obtaining earlier diagnosis and a more adequate isolation and release program; (3) maintenance of a constant supply of freshly isolated cultures for study and for use in pertussis vaccine; (4) a study of the cultures isolated, including serological and other reactions and, (5) an immunization study.

The data in the present report are concerned particularly with the cough plate as a routine diagnostic procedure in a public health laboratory. In Copenhagen, the method essentially as first used by Chievitz and Meyer [1] has

* Read before the Laboratory Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 12, 1933.

been employed since 1916 at the State Serum Institute.[2] In this country, its use seems to have been limited largely to special studies of whooping cough such as those of Sauer and Hambrecht,[3] Lawson and Mueller,[4] Culotta and Harvey,[5] and the demonstration by the Cattaraugus County Health Department, reported by Kline,[6] and to the temporary use for obtaining cultures of *B. pertussis* for study or use in vaccine. As a routine procedure in a public health laboratory, we believe the cough plate method has been quite neglected. In the Western Michigan Division of the Bureau of Laboratories, Michigan Department of Health, Grand Rapids, the cough plate diagnostic service for whooping cough has been available continuously since November, 1932.

EXPERIMENTAL METHODS

Cough plate medium—With few modifications, the original formula of Bordet and Gengou[7] has been used. The potato-glycerine-agar base is prepared in large lots and stored in 200 c.c. amounts. This base medium is melted and blood added as needed, at which time the finished medium is dispensed into glass Petri dishes for cough plates and into tubes for stock cultures. Because of its availability in our laboratory, sheep's blood is used for enrichment—having been found as satisfactory as human blood. To each 200 c.c. of base, 30 c.c. or somewhat less than 15 per cent of blood is added. Although this is much less than recommended by Bordet or reported by other workers, it has given as successful isolation of *B. pertussis* as larger amounts and has therefore been used throughout the study. In several lots of medium, the addition of lactic acid, as suggested by Gardner and Leslie[8] was tried but never with better results. In fact, such a medium had a tendency to darken and give less satisfactory growth.

The importance of the salt content of the medium came to our attention early in the study, in our attempt to explain occasional lots of base which partially hemolyzed the blood and gave less satisfactory growth. By the addition of titrated amounts of sodium chloride to such a base, the difficulty was overcome. No reason has been found for the relatively small amount of added sodium chloride in the original Bordet-Gengou formula. The final content was less than 0.5 per cent—a quantity of salt dangerously near the lower level tolerated by red blood cells. By substituting 0.75 per cent sodium chloride for the 0.6 per cent solution used in the original formula, we apparently have given the necessary safeguard against occasional lots with an insufficient salt content and there has been no inhibition of clear-cut hemolysis. This modification has made more certain the bright red plate so necessary to optimum results.

Exposure of plates—As is true for any laboratory specimen, proper collection of the cough plate is important. That successful exposure of the cough plate is not an insurmountable difficulty, however, is demonstrated by the fact that the data presented are based upon the findings in plates exposed by 22 physicians, 3 bacteriologists, 20 nurses and a number of mothers. The exposed plate is held 4–5 inches from the patient's mouth during several expulsive coughs. It is often necessary to induce a cough by tickling the throat with a swab or tongue depressor, by pressing on the larynx, by a drink of ice water, or by some other device.

Examinations of plates and Criteria for the identification of B. pertussis—The plates are examined several times during the first 48 hours of incubation for molds or spreaders which might overgrow the plate. Such colonies are cut out with a sterile needle or scalpel. At the end of 48 hours the plates are examined for colonies of *B. pertussis*

and this is repeated twice a day thereafter. If *B. pertussis* has not been found by the end of 4 days, a negative report is made. The plates are incubated and observed for 2 more days, at the end of which they are discarded. In the rare instance of a positive during that time, an additional report is made.

In a nicely seeded, uncrowded plate, colonies of *B. pertussis* can be recognized macroscopically after 48 to 72 hours with a great degree of certainty. As a source of light for examining the plates the ordinary sub-stage microscope lamp with white ground glass is very satisfactory. The uncovered plate is placed over the lamp and the colonies studied with the aid of a hand lens (10 x). By transmitted light, *B. pertussis* colonies appear smooth, raised, glistening, pearly, and almost transparent while the colonies of gram positive cocci in general appear duller, darkly colored and opaque. This light also reveals the zone of hemolysis which is characteristic of *B. pertussis*—a zone which is not sharply delimited but merges somewhat diffusely into the surrounding medium. In general, it may be said that the colony characteristics of *B. pertussis* on Bordet-Gengou medium are even more distinctive than are those of hemolytic or green producing streptococci on ordinary blood agar.

Confirmation of the identity of selected colonies is based upon several points. The consistency of the growth and the manner of its diffusion into water are very typical of *B. pertussis* and have been noted by Sauer.[9] As a loop of growth touches a drop of water or saline, it spreads and shows at first a momentary clumping but, with very slight agitation, it quickly smooths into a homogeneous suspension. Stained by Gram's method, *B. pertussis* decolorizes readily—much more readily, in fact, than does *H. influenzae*. Viewed microscopically, the small faintly-stained coccoid bacilli are scattered evenly throughout the film occurring singly for the most part, seldom in chains of even two and never observed as pleomorphic threads. Slide agglutination tests have been used frequently for the confirmation of colonies. The colony is emulsified in a drop of saline and a loopful of the suspension mixed with a loopful of antiserum, diluted 1:10, the remainder of the suspension being used as a control. Agglutination of *B. pertussis* is immediate and complete and readily observed with the unaided eye. The dried stained films, when observed microscopically, show the typical arrangement in the control suspension and definite clumps in the test suspension. These simple slide tests have proved reliable and of especial value in identifying suspicious colonies from plates too crowded or darkened by certain types of growth for the distinctive characteristics to be satisfactorily observed. In the case of less satisfactory plates, it is advisable to transplant suspected colonies to fresh medium. The resulting subculture grows sufficiently for identification within the next 24 hours.

Agglutination technic—The details of the method employed are outlined in a separate communication.[10] In brief, it is essentially the technic devised by Noble,[11] and it eliminates the troublesome, nonspecific settling and clumping of *B. pertussis* suspensions which have stood for a few hours. The antisera used for the tests were produced in rabbits by the injection of suspensions of recently isolated cultures and according to the terminology of Leslie and Gardner [12] were Phase I sera.

General plan of collecting plates—Since the cough plate diagnostic service was first offered, a number of physicians, mainly pediatricians, have used cough plates in all cases suggesting whooping cough. During the earlier months, members of the laboratory staff also collected plates as a part of the immuniza-

TABLE II

SUMMARY OF COUGH PLATE EXAMINATIONS

Clinical Diagnosis	*Number of Cough Plates*		
	Positive	*Negative*	*Total*
Whooping Cough Through 4 Weeks	163	63	226
Post-Whooping Cough, 5 weeks to 6 months after onset	2	166	168
Other than Whooping Cough	0	66	66
Clinical Data Not Available	0	35	35
Totals	165	330	495
Unsatisfactory Plates			16

tion study outlined above. The cases included in that series were for the most part in families receiving aid from the city, and therefore visited by city physicians and nurses. As the work enlarged, it became impossible for the bacteriologists to make all the required calls. In the meantime the City Health Department had found the laboratory results useful and in order to continue and enlarge the work, they offered the services of the Bureau of Public Health Nursing. Since this bureau uses the district nursing plan, it was agreed that each nurse secure the desired cough plates from welfare patients in her district. Because of her familiarity with the territory as a whole and with each family as a unit, the plan proved an ideal way of meeting the situation. The nurses, after instruction in technic, have been successful in exposing plates. A further step was taken recently when the City Health Officer, Dr. A. H. Edwards, offered Grand Rapids physicians the services of the nurses for collecting plates from their private patients. At present, then, most of the plates reaching the laboratory are collected by a group of about 25 nurses experienced in the procedure. Copies of all cough plate reports are sent to the City Health Department, as for other communicable diseases.

EXPERIMENTAL DATA

Summary of cough plates—In Table II is a summary of the cough plates submitted to the laboratory between November 1, 1932, and September 1, 1933, classified according to clinical diagnosis.

Whooping cough cases—The cough plates from patients with whooping

TABLE III

WHOOPING COUGH CASES: SUMMARY OF PLATES CORRELATED WITH STAGE OF DISEASE

Week of Disease	*Number of Plates*			*Per Cent of Positive Plates*
	Positive	*Negative*	*Total*	
1	62	20	82	75
2	55	24	79	70
3	39	8	47	83
4	7	11	18	39
5	2	17	19	11
6	0	12	12	0
Totals	165	92	257	

cough, so diagnosed by the physician, are summarized separately in Table III.

Because of its bearing on the practicability of obtaining cough plates on young children, it may be mentioned that of the positive plates tabulated, 42 were from children 2 years old or less. Of these 42 children, 9 were 5 weeks to 6 months, 3 were 7 to 11 months, and 30 were 1 to 2 years of age. In comparison, there were 23 negative plates from pertussis patients of the same age group, taken during the first four weeks of disease. In other words, approximately 65 per cent of plates obtained from children 2 years of age or less, during the first 4 weeks of disease, were positive.

Comparison with certain other reports—The percentages used in Table III were calculated on the basis of number of plates, without regard to the fact that in certain instances, there were several plates on the same patient. Most percentages recorded in previous tabulations have been based on the number of patients found positive, disregarding the number of examinations made to obtain the result. Calculating our percentages on this basis for the sake of comparison, we include them along with certain previous reports in Table IV.

There is no question that by more often repeated examinations the percentages could be markedly increased. Since our examinations on the 207 cases tabulated numbered 257, it is evident that the number of repeat examinations was not large.

Carrier data—Before we proceed very far with a discussion of whooping cough carriers, we feel the need for definition. For the sake of clarity in our own thinking and discussion, we consider as carriers those individuals harboring *B. pertussis* who, (a) have no symptoms—the healthy carrier, (b) have had whooping cough for more than four weeks—the convalescent or post-whooping cough carrier, and (c) have respiratory symptoms diagnosed other than whooping cough. On the other hand, the patient with an atypical cough not otherwise diagnosed and a positive cough plate, we consider not as a carrier but as an abortive case of whooping cough. The data in Table V include the findings in those individuals who, if positive, are classified as carriers according to this definition.

The only positive cough plates we obtained from 234 examined were two

TABLE IV

COMPARATIVE FINDINGS OF VARIOUS AUTHORS
PERCENTAGE OF WHOOPING COUGH CASES FOUND POSITIVE BY COUGH PLATE METHOD

Year of Report	Authors	Per Cent of Patients Found Positive Stage of Disease in Weeks						Total Cases
		1	2	3	4	5	6	
1924	Chievitz & Meyer [1]	75	57	61	45	40	9	914
1927	Lawson & Mueller [4]	59	53	33	38	15	6	533
1930	Sauer & Hambrecht [9]	98	—	65	—	0	0	200
1932	Gardner & Leslie [12]	75	67	75	25	0	0	47
1932	Culotta & Harvey [5]	82	56	19	2	0	0	129
1933	Sauer—7 yr. summary [3]	88	—	64	—	0	0	400
1933	Kristensen—15 yr. summary [2]	65	58	52	40	34	8	2,144
1933	Kendrick & Eldering	84	78	83	31	11	0	207

As tabulated here, the week of disease given for one author is not always strictly comparable with that of another. For example, Sauer gives his results in terms of catarrhal and convulsive stages; Kristensen in terms of catarrhal and 1st, 2nd, 3rd, and 4th week of convulsive stage.

TABLE V

COUGH PLATE EXAMINATIONS FOR CARRIERS

Clinical Symptoms	*Number of Plates*	
	Total	*Positive*
Post-Whooping Cough		
5th week	19	2
6th week	12	0
7th week	6	0
8th week	7	0
2 to 6 months	124	0
No Symptoms	13	0
Respiratory—Not Whooping Cough	53	0
Totals	234	2

during the fifth week after the onset of whooping cough.

The second attack—Although a second attack of whooping cough usually is considered an infrequent occurrence, 7 of the cases of this series gave a history of previous pertussis. There is, of course, always the question of the reliability of the history. The second infection in each case was confirmed by a positive cough plate. Mrs. B., age 27, had a severe second attack, and gave a history of a severe case when she was an infant. Mrs. M., age 30, had a moderately severe second attack. Her mother stated that she had had whooping cough when she was a child. Miss R., age 25, a city nurse, had an abortive case which will be described later, and said she had had whooping cough when she was about 5 years old. The other 4 cases were children. D. B., age 4½, had a typical case of moderate severity, and was said by his mother to have had a similar case when he was 1 year old. F. H. and D. H., brothers, age 4 and 5, respectively, had severe attacks and were hospitalized for several weeks, 1 child with a complication of pneumonia. The mother said they had had whooping cough 2½ years before. J. H., age 3, had a severe case. His first attack, only 6 months previous to the second, had been diagnosed by a pediatrician.

The abortive case—If we define as an abortive case an individual harboring *B. pertussis*, having respiratory symptoms but not developing the typical paroxysms, and with an attack not clinically distinguishable as whooping cough, 5 cases would be so classified, 4 of which were children who had mild coughs for 1 to 3 weeks, in homes where other children had typical whooping cough. The remaining abortive case was the nurse, Miss R., cited among the second attacks. She developed what she considered to be a bad cold accompanied by a cough which never became paroxysmal and lasted about a week. As she was interested in the cough plate method she exposed a plate from which *B. pertussis* was isolated. About 6 days later a baby in the house developed whooping cough, and as it had had no other known exposure, it was concluded that the case was contracted from Miss R. These cases serve to emphasize the value of the cough plate in detecting atypical whooping cough, as well as to point out the importance of the atypical case in the spread of the disease.

Time required for diagnosis—The time required to complete a laboratory diagnosis is an important practical consideration. In Table VI the positive results for 10 months are tabulated in terms of days required to make the report. The information was obtained

TABLE VI

INCREASE IN SPEED OF DIAGNOSIS DURING PROGRESS OF STUDY

Relative Period of Study	Per Cent of Positive Plates Reported on Various Days After Their Receipt						Total Positive Plates
	2	3	4	5	6	7+	
First 6 Months	3	43	27	13	5	10	109
		73			28		
Subsequent 4 Months	23	53	15	8	2	0	53
		91			10		

by comparing the entry date with the date of report on the filed laboratory blanks.

A practical point brought out in this tabulation is the lessening of the time required for diagnosis as the study progressed and greater facility was gained. With greater experience, there is increased facility in recognizing colonies of *B. pertussis* as soon as they appear and it becomes necessary only in relatively few instances to wait for subcultures for differentiation. During the latter part of the year, 76 per cent of all positive reports were made within 3 days, and 91 per cent within 4 days. We believe this compares favorably enough with certain other accepted diagnostic procedures.

Serological grouping of the cultures isolated—The maximum titers observed for the various antisera used in the agglutination tests ranged from 1:1,000 to over 1:4,000, in terms of final dilution in the 0.2 c.c. rapid test; or from 1:5,000 to over 1:20,000, expressed as equivalent titers—that is, in terms of the usual 1 c.c. test but based upon actual quantities of serum and antigen in the mixtures. For the sake of closer comparability with agglutination titers as usually given, the results of agglutination tests with 149 cultures are expressed in Table VII as equivalent titers.

All the Grand Rapids cultures, the 2 from Copenhagen, those from Sauer, the Lapeer, and the Phase I cultures

TABLE VII

SUMMARY OF AGGLUTINATION TESTS WITH 149 CULTURES OF B. PERTUSSIS

Number of Cultures	Designation of Cultures	Titers with Phase I Serum
136	Isolated at Grand Rapids	
	94 — to 14th day of disease	1:2,500 to 1:20,000+
	40 — 15th to 28th day of disease	1:2,500 to 1:20,000+
	2 — Over 28th day of disease	1:15,000 & 1:20,000
4	Old Laboratory Cultures (1911–1922)*	Negative (1:20)
6	Received from Lansing Laboratory	
	2 — Copenhagen	1:20,000
	1 — Lapeer, 1931	1:15,000
	1 — Sauer	1:15,000
	1 — Phase I Harvard	1:15,000
	1 — Phase III Harvard	Negative (1:20)
3	Received from Dr. Sauer, Evanston, Ill. recently isolated cultures	1:20,000

* Received through the courtesy of Parke, Davis & Co., Detroit.

from Harvard, were agglutinated to a significant titer by "Phase I" serum, while the 4 old laboratory cultures and the culture labeled Phase III were not agglutinated. From the tabulated data, it is seen that the Grand Rapids cultures were isolated at all stages of the disease—94 during the first 2 weeks, 40 during the third and fourth weeks and 2 after more than 4 weeks of disease. This suggests that, at least in their agglutination response, the cultures of *B. pertussis* did not change during the course of the disease. The agglutination of all these 144 cultures by "Phase I" serum is in harmony with the findings of Leslie and Gardner [12] with 20 recently isolated strains.

GENERAL DISCUSSION

Practicability of the cough plate method—It is with considerable interest that we have analyzed the results of the first year of continuous cough plate diagnostic service. Is the procedure practicable? Before starting this study, we were well aware of the difficulties held up as a warning to any workers who might be tempted to take the cough plate seriously. As in any diagnostic procedure, there are certain difficulties to overcome in mastering the technic. After a year's experience, however, we believe the difficulties have been overemphasized. Great stress has been placed by various writers upon the differentiation of *H. influenzae* and *B. pertussis*. With a properly balanced medium and increased experience in examining the cough plate, this problem tends to vanish. The necessity of securing a constant, uniform and adequate supply of blood has been met under our particular conditions by the use of sheep's blood. *B. pertussis* is easily isolated on a medium enriched with sheep's blood, it grows well in mass culture, it is antigenic, and it produces toxic symptoms in animals. With respect to the time required for diagnosis, we have shown that an unreasonably long period is not necessary, and it is entirely possible that future studies of the growth requirements of the organism will materially shorten the present minimum period. An important aid in making the procedure practicable in our particular community is the coöperative plan with the City Health Department already outlined. In brief, there are no insurmountable difficulties surrounding the cough plate technic and we believe it deserves a more prominent place than it now occupies in public health laboratory procedure.

The value of negative cough plate findings—Particularly in studying the period of infectivity, we wish to know how much dependence can be placed on negative findings. It is generally true of diagnostic procedures that negative results do not carry the same weight as positive ones. We do rely on them to an extent, however, in various communicable disease release procedures. Whether negative cough plates can be used as an indicator of the probable state of infectivity of a patient at the end of his isolation period is under study. The Michigan Department of Health regulation states that, "Patients shall be isolated for 3 weeks after development of the characteristic cough." The city of Grand Rapids requires 4 weeks. During this fourth week of isolation, we are securing 2 cough plates at least a day apart. We are hopeful that this study will afford information that will help to answer the question as to whether the cough plate has a place in the release of whooping cough. It is safe to say that the value of negative plate findings increases in direct proportion to excellence in technic of obtaining plates and facility in laboratory diagnosis.

The period of infectivity and the post-whooping cough carrier—Any discussion of whooping cough is limited by the difficulty of exactly establishing the

stage of disease and the impossibility of achieving entirely adequate definition of terms. Under the conditions of our own study, we have been able to determine with sufficient accuracy the date of onset and we have, therefore, expressed the stage of disease in terms of the day or week after onset of symptoms. We realize that designations by different workers of the week of disease cannot be strictly comparable. For example, many clinicians place the date of onset of a disease at the time when symptoms are severe enough for a physician to be called or for the patient to go to bed, whereas epidemiologists set the date of onset as the time when the first indication of illness is noted. However, keeping the limitations in mind, we believe a comparison of the results of different workers with respect to the period of infectivity as indicated by cough plate findings, has meaning and yields considerable information.

By referring to Table IV it is seen that aside from the reports of Chievitz and Meyer and of Kristensen, relatively few positive findings have been reported after the fourth week of disease. The findings in general point toward the first 4 weeks of disease as including the infective period in most instances. Our positive findings suggest that most whooping cough patients are actively infectious during the first 3 weeks, a certain percentage remain so during the fourth week and most of them are noninfectious after the fourth week.

As found in other communicable diseases, there are occasional individuals who harbor the infecting organism for longer than the average period. Just how important these individuals are as a reservoir of infection in whooping cough and whether they can be located by the culture method remains to be worked out. If it were true, as suggested by several authors, that the organisms lose their virulence during the course of the disease, the carrier would present no problem; but convincing data on this point are lacking. It seems likely that the early case offers the greatest opportunity for exposure and is the most potent source of infection in whooping cough. However, we cannot disregard the significance of even a small per cent of post-whooping cough or convalescent carriers. To go a step further and translate the findings with respect to the period of infectivity into practicable communicable disease regulations is a problem for coöperative study between health department and laboratory and one which will require time.

Indirect results of cough plate study —Besides the more direct results which we believe are being obtained by the routine plate service, there are less tangible effects which play a part in the general effort toward whooping cough control. The members of the community in general are reminded of the disease and its importance and they are impressed with its communicability. As a physician recently expressed it, "Grand Rapids is whooping cough conscious." The district nurses are on the alert for suspicious cases. With the nurses available for collection of plates, more physicians are making use of the cough plate service, and incidentally they are reporting their cases to the Health Department. This increased emphasis upon whooping cough has the general effect of encouraging early recognition and better isolation.

SUMMARY AND CONCLUSIONS

1. Cough plate diagnostic service for pertussis has been available continuously for about a year at the Western Michigan Division Laboratory of the Michigan Department of Health, Grand Rapids. It is proving a practicable procedure under the conditions existing there.

2. During the past 4 months of this service, 23 per cent of the positive

diagnoses have been made within 48 hours after the plates have reached the laboratory, 75 per cent within 72 hours, and 91 per cent within 4 days.

3. The laboratory findings are being used by the City Health Department in obtaining earlier diagnosis of pertussis and thereby, it is hoped, more effective isolation of cases in their most infective stage. The possible applicability of the results to the problem of release is under study.

4. In agreement with the reports of most other authors, *B. pertussis* could be isolated from relatively few patients after the fourth week of disease. A patient with whooping cough of more than 4 weeks' duration, who can be shown to harbor *B. pertussis*, is defined tentatively as a post-whooping cough or convalescent carrier.

5. One hundred thirty-six cultures isolated from whooping cough patients, at times ranging from before onset to the 35th day of disease, were found to fall into the same serological group.

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NOTE: The authors express their appreciation of the helpful coöperation given by the different divisions of the Grand Rapids City Health Department, Dr. A. H. Edwards, Health Officer. Especial mention is made of the assistance given by Dr. L. J. Schermerhorn, pediatrician; and by B. Randall and her associates of the Bureau of Public Health Nursing.

Nutrition and Mental Outlook

"INDEED, the effect of nutrition on human physiology is so marked that one might even attribute an association between the unrest and distrust seen in the world today and the dietary which is directly affected by the economic situation. The hungry man is proverbially an angry man, and consequently discontented. It is common experience that the temperament and general outlook on life is governed by one's diet, its digestion, and its effect on the liver. The jaundiced view of life is only an extreme expression of varying degrees of nutritional deficiency or excess. Our food refineries, tinned foods, rapid consumption of meals which we do not take time to enjoy or digest, may be affecting the mental outlook and destroying that peace and contentment to be found in adequately nourished individuals, particularly the beer-drinking, beef-eating Britisher."—J. O. Murray, M.D. The Public Health Outlook on Nutrition, *Pub. Health*, Feb., 1934, p. 164.

Immunity to Diphtheria and Response to Artificial Immunization of Children in Rural Virginia*

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THE rate of development of naturally acquired immunity to diphtheria and its level vary in different population groups and are influenced by numerous factors of environment. Density of population has been shown to be a factor having a great influence upon the natural development of immunity to diphtheria, also prevalence of the disease and variations in carrier incidence influence the speed with which a given population becomes immunized. Climate apparently not only influences the clinical aspects of the disease but there is evidence that in warm climates natives acquire immunity earlier and more rapidly than do natives of colder climates. With possible wide variations in natural immunity in mind it seems that the determination of the immunity status of a given population before attempting mass immunization is an important administrative procedure.

In order to obtain as nearly as possible a representative cross-section of the diphtheria immunity status of children of rural Virginia, a study was undertaken in 5 different counties representing the most typical geographic, economic, and environmental differences which might influence the development of naturally acquired immunity to diphtheria.

The variation in the immunity of children giving no history of previous immunization in these 5 different counties is shown in the age groups 5 to 9 and 10 to 14 in Figure I.

Buchanan County, having the highest percentage of Schick negative children, is a typical rural, isolated, mountainous county in southwest Virginia. With the exception of one village with a population of 800, there are no communities with over 100 persons. There were no hard surface roads in the county at the time of the study, and intercommunication is extremely limited. The population of the county in 1931 was 16,900. The death rate from diphtheria in 1931 was 21.6, the average death rate during the past 8 years was 36.4.

Orange County, having the second highest percentage of Schick negative children, is a typical progressive, farming county of north central Virginia. There are two incorporated towns of 1,381 and 462 population respectively. There is free intercommunication in the county and there has been extensive school consolidation. The population of the county in 1931 was 12,070. The death rate from diphtheria in 1931 was 0.0, the average death rate for the past 8 years was 4.0.

Pittsylvania County, having the third

* Read at the Second Meeting of Southern Branch, American Public Health Association in Richmond, Va., November 15, 1933.

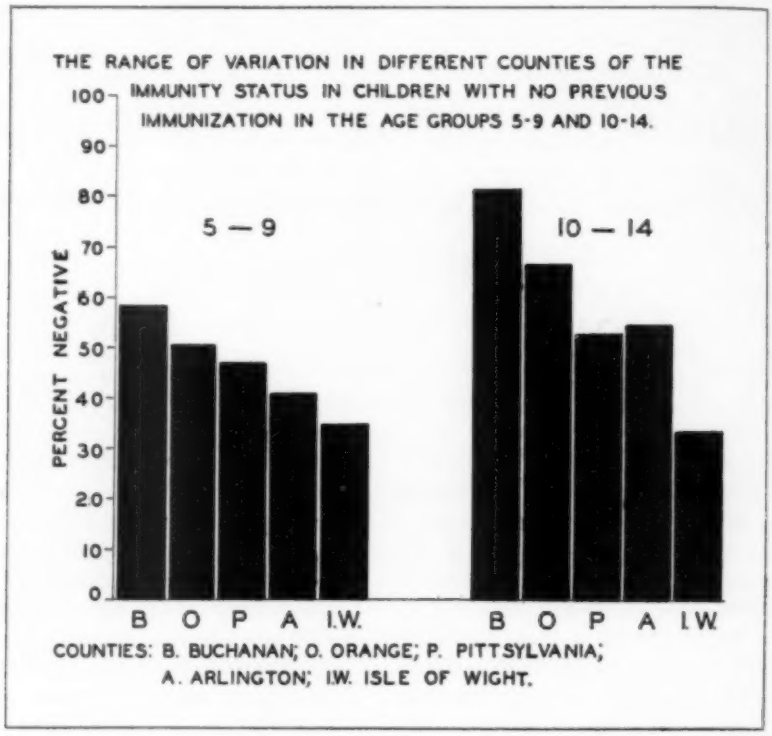

FIGURE I

highest percentage of Schick negative children, is a typical county of the cotton and tobacco belt. There is one city of 22,300 population which was not included in the study. The population of the county in 1931 was 62,000, 31 per cent of which were colored. The death rate from diphtheria in 1931 was 11.3, the average death rate from diphtheria for the past 8 years was 10.0.

Arlington County is a suburban county situated adjacent to Washington on the Potomac River and is populated, to a very considerable extent, by commuters to Washington. The population of the county in 1931 was 29,100. The diphtheria death rate in 1931 was 0.0, the average death rate from diphtheria in this county for the past 8 years was 2.8.

Isle of Wight, having the lowest percentage of Schick negative children, is in the farming section of Eastern or Tidewater Virginia. There are no towns in the county of over 1,000 population. There has been extensive consolidation of the schools. The population of the county in 1931 was 13,400. The death rate from diphtheria in 1931 was 22.4, the average death rate for the past 8 years was 9.1.

The differences seen in the immunity of these different groups show quite clearly the necessity of the determination of the immunity status of any specific group when mass immunization is to be carried on. The differences in the immunity status in these counties cannot be easily explained. Approximately 10,000 children of all ages were Schick tested during the study in the 5 Virginia counties; approximately 6,000 of these gave no history of previous immunizing treatment.

Figure II shows the percentage of naturally Schick negative children in each year of age in this entire group of 5 counties. The usual rapid rise is seen in the curve during the first 6 years of life and very little increase in the percentage of Schick negative reactors is noticed in the age groups above 9 years. The roof of the curve is between 60 and 70 per cent and this roof is reached between 10 and 12 years and remains quite constant in the higher ages. It may also be seen that at 6 years (the usual age of school entrance in Virginia) about 50 per cent of the children are Schick negative. This would indicate that mass immunization of school children in Virginia without previous Schick test is not justified nor is it economical.

About 30 per cent of the children whom we Schick tested in our study had had some form of immunizing treatment during the previous 5 years. The majority had been given toxin-antitoxin, although a few had received toxoid within the last 2 years.

Figure III shows a comparison of the immunity found in treated and untreated children in rural Virginia by years of age. The lower graph showing the percentage of Schick negatives among those who gave no history of previous immunization is the same as that shown in Figure II. It is interesting to note in the treated children that there is no great change in the percentage of immunes after school age. The curve at that age is between 75 and 80 per cent, which is a drop from the original level and quite different from that seen in the group of untreated children.

In our work with alum precipitated

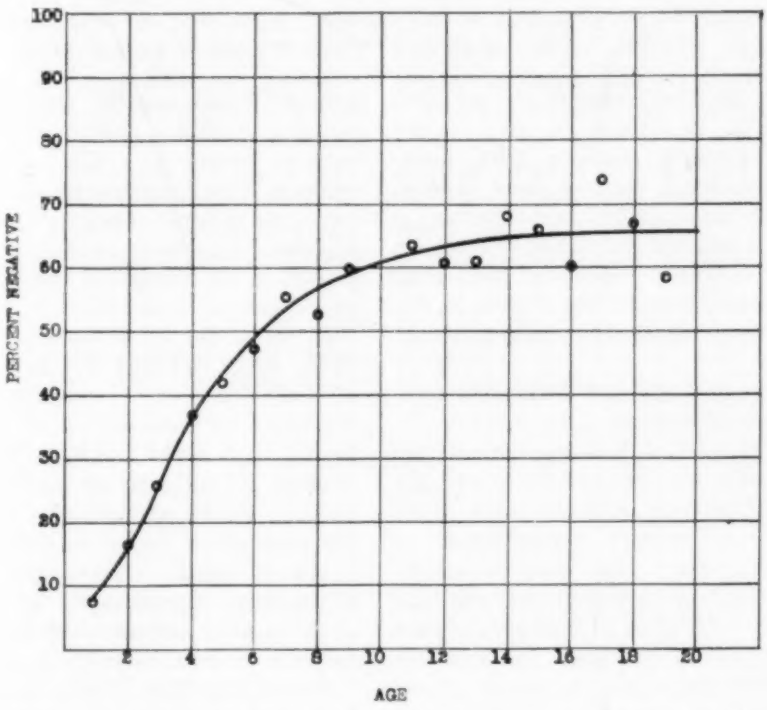

FIGURE II—The immunity status of rural children, with no history of previous immunization, by years of age

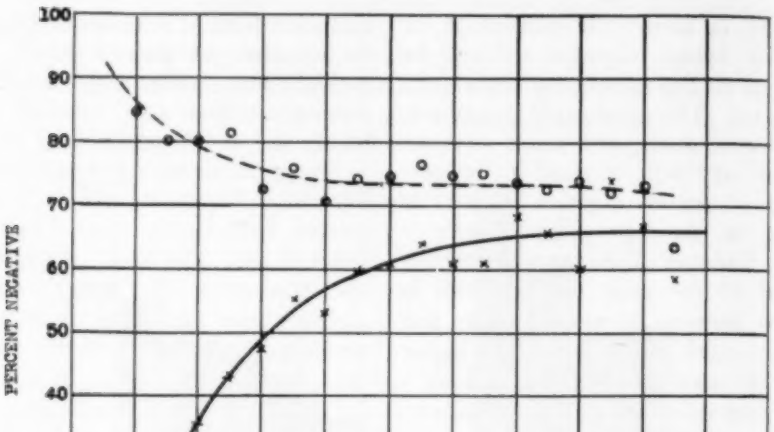

FIGURE III—A comparison of the immunity in children of rural Virginia according to history of previous immunization and by years of age

toxoid we have obtained 95 per cent immunity as against 60 and 70 per cent immunity obtained with toxin-antitoxin which most of these children had received. It will be interesting to observe whether this curve will remain higher in those immunized with alum precipitated toxoid than it does in this group immunized with toxin-antitoxin.

STUDY OF THE EFFECTIVENESS OF VARIOUS IMMUNIZING AGENTS

In 1913, Von Behring showed that diphtheria toxin neutralized or partially neutralized with antitoxin could safely be used for the immunization of humans. Since that time toxin-antitoxin mixtures have been used widely in the immunization of children against diphtheria and have undoubtedly greatly reduced the incidence of the disease in many groups. This method of immunization is reported to have rendered Schick negative from 60 to 85 per cent of Schick positive children by various observers. The percentage rendered Schick negative by this method seems to depend somewhat upon the diphtheria experience of the community as well as the amount of toxin injected and degree of under-neutralization.

In 1923, Ramon showed that diphtheria toxin modified by the addition of 3 or 4 per cent formaldehyde and incubated at from 38 to 40° C. for from 4 to 6 weeks lost its toxicity but retained its antigenic properties. This product, known as anatoxin or toxoid, has been shown to be an effective immunizing agent. The degree of its effectiveness depends upon the potency of the product and upon the dosage and the time interval between doses.

As early as 1889, it was observed by Roux and Yersin that diphtheria toxin was precipitated by potash alum and

this substance was used in the purification of toxin. In 1926 Glenny, Pope, Waddington, and Wallace showed also that diphtheria toxoid was precipitated by potash alum and that the antigenic properties of toxoid so precipitated were enormously increased. Precipitation also makes possible a much greater concentration of the toxoid and the elimination of a greater amount of protein. Havens and Wells showed that one dose of completely precipitated toxoid produced an extremely high degree of immunity in guinea pigs. Graham, Murphee, and Gill report that 92.4 per cent of 185 strongly Schick positive children were rendered Schick negative by a single dose of this product and that 96.6 per cent of a group of 613 children whose immunity status was unknown were rendered Schick negative in from 2 to 6 months. Seventy-two per cent of the latter group were of preschool age.

In Virginia in 1931 the morbidity rate from diphtheria increased more than 100 per cent while the mortality rate increased about 60 per cent over the preceding 5 years. These increases occurred in spite of the fact that a diphtheria campaign had been carried on during 1928 and 1929 during which approximately 200,000 children had been given three 1 c.c. doses of toxin-antitoxin. This marked increase in the prevalence of diphtheria aroused considerable apprehension and served as a stimulus for a detailed study of the effectiveness of various forms of active immunizing agents.

During our study we have treated 447 Schick positive children with one dose of ½ c.c. of toxoid containing 10 units per c.c.; 239 children with toxoid containing 10 units per c.c. with 0.2 per cent alum added; 375 children with two ½ c.c. doses at weekly intervals of toxoid containing 10 units; 338 children with two doses at weekly intervals of ½ c.c. of toxoid containing 10 units with 0.2 per cent alum added; 324 children with one dose of ½ c.c. alum precipitated toxoid containing 12.5 units per c.c.; and 255 children with one dose of 1 c.c. of alum precipitated toxoid containing 12.5 units per c.c.

Table I shows the per cent of Schick positive children rendered Schick negative 6 to 9 weeks after the administration of various toxoid preparations.

There is no significant difference between the per cent of Schick positive children rendered Schick negative with one dose of toxoid with or without alum, nor is there any significant difference between per cent rendered Schick nega-

TABLE I

THE PER CENT OF SCHICK POSITIVE CHILDREN RENDERED SCHICK NEGATIVE 6 TO 9 WEEKS AFTER THE ADMINISTRATION OF TOXOID PREPARATIONS

				Re-Schick Tests	
Group	*Toxoid Per c.c.*	*Amount Given in c.c.*	*Number of Injections*	*Number Tested*	*Per Cent Negative*
I.	10 Units	0.5	1	447	83.7
II.	10 Units with 0.2% alum	0.5	1	239	85.0
III.	10 Units	0.5	2	375	94.2
IV.	10 Units with 0.2% alum	0.5	2	338	95.3
V.	Alum Precipitated 12.5 Units	0.5	1	324	93.8
VI.	Alum Precipitated 12.5 Units	1.0	1	255	96.1

tive by two doses of toxoid at weekly intervals with or without alum. However, there is a significant difference between the per cent rendered Schick negative by one dose of toxoid with and without alum and two doses of toxoid with and without alum. There is no significant difference between the results produced by one dose of ½ c.c. of alum precipitated toxoid and one dose of 1 c.c. of alum precipitated toxoid. As there is some difference in the age distribution in these various groups it seems advisable to take one age group where the numbers are large enough to be significant and compare the various preparations. As there is no difference between Group I and II, or between Group III and IV, or Group V and VI, they may be combined.

TABLE II

COMPARISON OF THE EFFICACY OF TOXOID PREPARATIONS FOR THE AGE GROUP 5 TO 9 AND COMBINING, FROM TABLE I, GROUPS I AND II, III AND IV, AND V AND VI

		Re-Schick Tests	
Groups	*Number of Injections*	*Number Tested*	*Per Cent Negative*
I and II	1	287	86.4
III and IV	2	285	95.4
V and VI	1	266	95.9

Table II shows clearly that one dose of alum precipitated toxoid is as effective as two doses of toxoid containing 10 units with 0.2 per cent alum added.

We realize that our experience is not very large and that there may be some geographical and environmental differences in the populations treated which may affect the production of immunity. In our experience there has been an apparent slight racial difference.

We realize that there are questions which may be raised concerning the details of the study. The first question, we believe, would be as to the standardization of the Schick test and the personal element in the reading of the test. All of the work has been done by the authors. We used Schick test material from one biologic firm. In order to check this material we used, as controls, heated toxin on 3,000 children. Dr. W. T. Harrison, of the U. S. Public Health Service, furnished us with a standard toxin sufficient to test 1,000 children and checked our technic. We gave two tests, one on each arm, to 1,000 children using the standard toxin on one arm and the commercial toxin on the other arm. The results checked perfectly with the two toxins. After watching us give and read 3,000 tests Dr. Harrison was satisfied with the technic used. A third question, which may be brought up, is the permanency of the immunity produced. It is our plan to follow as large a group of children as possible who have been immunized in order to determine the duration of the immunity produced by the various toxoid preparations.

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NOTE: We are indebted to Dr. William H. Park, of the New York City Health Department, for the toxoid and toxoid with alum added; and to the late Dr. Leon C. Havens, of the Alabama Health Department, for the alum precipitated toxoid used in this study.

Need for Uniform Practices in the Microbiological Examination of Food Products*

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THE presence of microörganisms in food products, with their influence upon quality and methods of preservation, is of great importance to food microbiologists. Not only have we learned the significance of the presence of some common types of bacteria, but we have found new organisms that are responsible for spoilage in products in which their presence had never been suspected. Control over pathogenic and infectious organisms is essential, but is not enough, since the quality and safety of many foods depend upon the control of spoilage bacteria, yeasts and molds.

With greater attention being given to the microflora of widely different types of food products, the necessity for standardization of the methods of microbial analysis is apparent. This is borne out by the experience of the U. S. Department of Agriculture and other agencies in the increasing number of requests for advice as to the most reliable methods of determining the microbic population of this or that food product.

Little effort has been made to unify the procedures employed in various laboratories. The methods of sampling, culturing, incubating and interpreting the results are matters of personal choice. Nowhere are there available detailed directions which through wide and thorough study by many workers have been simplified and standardized for general use in the examination of many of the common food products.

Because of the interest in the proper control of the manufacture and handling of foods, it is natural that a movement to standardize laboratory procedures of this type should have its inception in our Association. A committee of the Food and Nutrition Section undertook to organize the work by developing coöperation between the American Public Health Association, the Association of Official Agricultural Chemists, and the Society of American Bacteriologists. The Society of American Bacteriologists appointed a representative to follow the work and coöperate where feasible; and the Association of Official Agricultural Chemists, after amending its constitution and by-laws to include microbiologists, appointed a referee to coöperate in the work. The Laboratory Section of our Association also appointed a representative to coöperate. Thus there has been organized a group of food microbiologists representing the major organizations in the field who will coöperate closely in developing standard procedures for the microbial analysis of foods.

* Food Research Division Contribution No. 198, read before the Laboratory Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 10, 1933.

The value of standardizing the more common tests used in microbial food analysis is apparent when we consider the wide and insistent demand for such analyses. Every state in the Union conducts some type of official food analysis, and practically all cities of metropolitan size (500,000 population or over) maintain food analytical laboratories. Many college, university, and consulting laboratories are called upon to make analyses in which they have had but little experience, either with the food products, or with the special methods required. Standardization makes available uniform and accepted methods which will simplify the microbial analysis of food products. Reproduction of results by different laboratories is readily obtainable and their interpretation easily confirmed. Further, with accepted directions available in printed form, analyses would be made in laboratories where such tests are not now made.

Selection of the types of food or the methods of analysis requiring earliest attention is a difficult matter. What appears insignificant today may be of paramount importance tomorrow. In general, foods can be grouped into several classes, such as canned foods, dried fruits and vegetables, meats and meat products, fermented foods, and marine products, so that, for the work under way, the development of methods for each class can be placed under the supervision of a laboratory worker well qualified in that particular field. In today's program we will hear from men who, because of long experience and familiarity with their fields, have been requested to review the present status of methods for the microbial analysis of certain types of products. These topics have been selected either because there is considerable information available, or because there is a special demand for information at this time.

The microbiological aspects of foods is of great economic importance, both from the standpoint of spoilage and deterioration and from that of public health. Standardization of laboratory procedures for such microbial examination is a present necessity and not only will aid in the better protection of the health of the consuming public, but pave the way for development of new and improved methods of food preservation.

Does the Press Want Health Statistics?*

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THIS has not been a difficult paper to write. First, it asks a question, "Does the press want health statistics?" and gives the answer, which is *Yes*. Second, it points out certain types of information, based on health statistics, which the newspapers like to use—both for news items and for editorials. Third, it endeavors to tell what profit the health departments and the public health movement in general gain through the use by the newspapers of health statistics.

I asked a friend, who is a newspaper man, why the newspapers of today give so much more space to "stories" based on health and medical statistics than was the case 20 or 30 years ago. "The answer," he said, "is easy. The newspapers want news and the vital statistics people are giving it to them. Every man," he went on, "consciously or unconsciously, watches his health, and speculates on his chances for a long life. He is interested—not only in the fact that the average length of human life is being prolonged, but in the details of how this is being accomplished. And don't forget," he added, "that no element in American life is more public spirited than the American press. The newspapers are perhaps the strongest allies of the public health movement."

How then may we, the members of the Public Health Education and Vital Statistics Sections, best capitalize the willingness of the newspapers to aid in public health education through public health publicity?

I wish that I had begun years ago to keep a record of the publicity given by the daily press to health items which were based on statistical data. I would like systematically to go over the files of the newspapers to determine the relative news appeal of items which have had their source in the statistical laboratories—the news appeal, as measured by the number of times the newspapers have published items on various health topics, and the number of lines and inches of newspaper space given to each.

In the first place, let me impress upon you that every state or municipal health department should endeavor to keep its records of mortality and sickness as nearly current as it is humanly possible to do. The newspapers prefer news to history. The daily papers in any given city, for example, would like to tell their readers *early* in 1934 whether the death rate of 1933 was higher or lower than that of the year immediately preceding. They would like to print, in January, the facts about the important causes of death—for, in January, they are news, whereas in July they are merely history. Is it practicable or possible, then, for the health departments to turn out current, or nearly current

* Read at a Joint Session of the Public Health Education and Vital Statistics Sections of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 11, 1933.

vital statistics? Well, we in the Statistical Department of the Metropolitan Life Insurance Company do it for our mortality statistics, and we have a much larger population and a much more extensive mortality experience than any state in the country. In fact, in our Industrial Department alone, we deal with the deaths among approximately one-seventh of the entire populations of both the United States and Canada. The great City of New York does it, and the newspapers gladly print the facts given them because their timeliness gives them a definite news value.

By running back over rather fragmentary records and drawing on my recollection I am able to cite for you some of the subjects concerning which statistics have been widely published on account of their news value. It should be perfectly feasible for many state and municipal health departments to give out much similar information for their own communities. Regardless of whether your own health department is, or is not equipped to give out health particulars like those I am about to mention, I submit that all of them have a distinct public health interest. Here are some of these subjects.

1. The effect of tuberculosis on the average length of life, showing how much longer the average life would be in America if it were possible to eliminate tuberculosis. Various articles on tuberculosis with emphasis on its declining death rate, showing how this decline has been brought about; also the probability of further reduction, until tuberculosis may actually become one of the minor causes of death.

2. Heart disease as a fruitful field for preventive health work—showing the brighter side of the heart disease picture, namely, that the death rate is declining among children and young adults—and telling why.

3. Vacation typhoid — a warning against the shallow infected well, flies, polluted milk, etc. Information of this type, obviously, should be given out shortly before the vacation season, with a reminder based on statistics, that the typhoid death rate is highest in August, September, and October.

4. Summer drownings—how to safeguard against them; methods of rescue, etc.

5. An analysis showing that poor teeth are an important cause of ill health, and that they frequently superinduce diseases which cause death.

6. Proving that public health is national wealth; that the well directed expenditure of money for the conservation of health will increase the wealth of the community more than any other equal investment of public funds.

7. A series of articles on the value of human life. These articles should stress such items as the cost of being born, of food, clothing, shelter, education, medical and dental care, recreation, etc., and point out the moral that every human being constitutes an investment and that his early death means an actual loss of money to the community.

8. What accident prevention, or reduction, means to a community.

9. What medical service in industry has accomplished.

10. Death as a factor in family damage—stressing the far-reaching consequences of the death of a parent.

11. Why tolerate diphtheria? A plea for immunization stressing the responsibility of the parents and pointing out how school superintendents can also help.

12. The value of periodic medical examinations.

13. Showing that accidental burns is the only form of violence that kills more women than men, and telling why.

14. The seasonal factor in mortality.

15. Accidental poisonings among young children, stressing, in particular, the danger which arises from leaving

pills containing strychnine where children can reach them; and the necessity for having warning signs and striking labels on containers.

16. A new field for the child welfare associations, pointing out how it is possible for the women of America to do as much to prevent accidents to children as they have done to conserve child health.

17. Child suicide. Back in 1927, there was a succession of child suicides. There was a lot of excitement about this until we in the Metropolitan gave the cold facts to the press, namely, that child suicides were, after all, of negligible numerical importance—that the actual death rate had been going down, for years, and that at the very time suicides among children were receiving so much publicity the child suicide death rate was only half what it had been 10 years before.

18. The origin of fatal accidents. How many in the home? How many in public places and in industry? Similar facts for non-fatal accidents.

19. An article on smallpox. Such an article was published in literally hundreds of newspapers because it showed that the only states where the smallpox situation had been at all serious were the very ones where our anti-vaccination friends had been the most active.

20. The prevention of maternal deaths—showing that through proper medical care and nursing two-thirds of them are preventable.

21. How cities may reduce automobile deaths. For example, questionnaires might be sent to safety officers in cities which had experienced notable reductions in fatal automobile accidents, asking how this was accomplished, and the summation of their replies given to the press.

22. An article showing that lower death rates mean fewer orphans.

23. The relation of body weight to certain causes of death.

24. Chronic lead poisoning in infancy, showing, on the basis of statements from a number of the country's leading pediatrists, that lead poisoning among infants is more prevalent than is generally known.

25. Fatal accidents in old age—where and how they occur.

26. The necessity of maintaining the public health services, Federal, state and municipal, at maximum efficiency during the depression.

27. The change in the rank of leading causes of death. Comparison with the facts of the first quinquennium of the century with the latest 5-year period.

28. Wet clothing and the common cold.

29. Showing that there has been a 40 per cent increase in life expectation within 40 years.

These are by no means all of the subjects on which it is possible to give to the press interesting, newsy information, based upon statistical studies.

Ladies and gentlemen of the Sections on Public Health Education and Vital Statistics, you possess a body of knowledge which, whether you appreciate it or not, constitutes *news*. The papers want facts like these. But here I must interject a note of warning. They do not want them in the form that they sometimes appear in your own reports. Your method of analyzing the most potentially newsy data may be scientific; but it may be excessively dull. The newspaper reporter, or the editor, is apt to be impressed only by its formidableness and to shy at the task of translating it into everyday United States. It would be a fine thing if every state health department, and that of every large city, could employ, on a part-time basis, a trained newspaper man to write "releases" for the daily press. In this way a world of public health publicity, now lost, would be forthcoming.

Now, what do the health departments gain, and how does the public health movement profit by the publication of news and editorial items on subjects like those I have mentioned? For one thing, it tends to strengthen community interest in the health services and to stimulate a public demand that they be adequately supported. Such publicity constitutes the best kind of public health education; it tends to make the people more health-minded and more safety-minded; it thus promotes public and personal health and safety; and it is, accordingly, an important element in conserving and prolonging human life. These, I submit, are the objectives toward which we are all working.

N. T. A. Meeting in Cincinnati, May 14-17

THE preliminary program of the 30th annual meeting of the National Tuberculosis Association will be found in the March *Bulletin* of that organization, copy on request.

The program opens on Monday night, May 14, and extends through Thursday, May 17. The Clinical Section will meet in two sessions and a joint session with the Pathological Section. The joint session will be devoted to a symposium on collapse therapy treated both from the point of view of the pathologist and clinician. The Pathological Section will have three sessions. The Sociological and Administrative Sections have arranged their program in the form of a symposium. Among the topics to be discussed in the three Sociological Sections are: (a) Relative Values in Tuberculosis Work, with papers by Jessamine S. Whitney and Bleecker Marquette; (b) Race, Sex, and Industry as Factors in the Tuberculosis Problem, with papers by C. Howard Marcy, James J. Stone and L. H. Ferguson; (c) Case-finding, with papers by J. B. Amberson, George C. Ruhland and Clarence L. Hyde; (d) Social Service in Tuberculosis Work, with papers by Paul L. Benjamin, and Ida M. Cannon; (e) A panel discussion with a group of speakers.

The Administrative Section will have two sessions including the following topics: (a) The Family Physician and Tuberculosis Control, with papers by W. S. Leathers, M. F. Haygood and John H. Peck; (b) How Effective is Health Education, with papers by Ruth Heavenridge, John Sundwall, and Mary P. Connolly. Headquarters will be in the Netherland Plaza Hotel.

Local Publicity Use of Statistics from National and State Sources*

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IT is obvious that the local health officer is dependent upon state departments of health, upon the U. S. Public Health Service, and upon the large insurance companies for national and state statistics. He is under obligation to them for a vast and varied amount of important information otherwise unobtainable. How else could he compare his community's morbidity and mortality with that of other localities in the same class, or with the state's or the nation's as a whole? From this standpoint, he should be appreciative of the storehouses of facts opened wide to him by these organizations.

He is preparing, we shall say, for a diphtheria immunization campaign. He is familiar with the manufacture of toxin-antitoxin or toxoid and with the technicalities of administering it. But in order to convince his public of the need for the program, he will have to explain what is being accomplished in other parts of the county, the state and the nation. This information, if skillfully presented, can be made a principal feature of local newspaper items, pamphlets, bulletins, window exhibits and of talks both before clubs and person-to-person.

If he were obliged to assemble the data for such a purpose, his department might as well give him a year's leave of absence and employ another health officer. As it is, he has merely to write his state department of health. It is as easy as that to obtain statistics on innumerable public health subjects. In fact, it is so simple that we are prone to take too much for granted the labor involved in the compilation of such statistics.

From another standpoint—that is, from the standpoint of releasing statistical news to the press—I sometimes wish the national and state organizations were less prolific. One reason is this—Health officers are coming to understand more and more the desirability of planning their publicity. We are possibly 25 years behind the times in this; certainly we are far behind the commercial agencies; but I believe we at last see the need for having a system in our publicity as well as having a system in, for instance, our schemes of communicable disease control.

The press will allot about so much and no more space to news from the public health field, except, of course, in times of epidemics. Suppose, then, a local newspaper receives simultaneously one news release from the state, or the U. S. Public Health Service, or the Metropolitan Life Insurance Company, and one from the local health officer. Which will the editor consider of greater significance? The first one. Distant pastures are greenest, you know. The release may happen to be

* Read before a Joint Session of the Public Health Education and Vital Statistics Sections of the American Public Health Association, at the Sixty-second Annual Meeting in Indianapolis, Ind., October 11, 1933.

on the subject of Rocky Mountain spotted fever, of which disease the city never had a case. The health officer's news may happen to be of a preschool examination clinic being held preparatory to the fall term of school. Ten chances to one, the first item will be printed. Readers will thereby receive a vague impression of a disease remote to them in any case; and parents of preschoolers will miss the urgent news that here is an opportunity of learning whether or not Johnny is in fit physical condition to begin school.

From still another standpoint, I often wish the national and state organizations were more conservative in releasing statistics. It is their tendency to make health conditions appear very fine. We read something like this—"Years of life wrested from tuberculosis—Very considerable declines in the mortality from tuberculosis and pneumonia are the most important items on the favorable side of the 1933 health record, to date." (1) If you are doing public health work in the field, you will appreciate that such an item, if published inopportunely, would not help a local health officer in an effort to increase his appropriation for tuberculosis work. Neither would it help to draw to the reader's attention the still too great incidence of both tuberculosis and pneumonia.

Or, for instance, we note this, "New low for milk-borne epidemics—The year 1932 closed with a new low record for milk-borne outbreaks." (2) Reading this desultorily, as the typical newspaper reader does, would not place him in the frame of mind to lend support in a campaign for pasteurized milk.

Or we find this, for example, "Notwithstanding the continued depression . . . the health of the people of this state during the year 1932 has in general been most favorable." (3) A local board of health might be pardoned for considering it allowable in the light of this news to reduce its budget, even though, perchance, their health officer knew conditions in that particular locality to be much less favorable.

I am not overlooking the fact that elsewhere in these representative articles, the other side of the picture is touched upon. Nevertheless, the best angle is featured. We, as public health enthusiasts, will read all of the articles if printed in full. But what of lay readers? It is a well known fact that many persons read only the first part of news items. Furthermore, newspapers usually caption the good points and pass quickly over such news as a gradual increase in deaths from certain causes, unless it is great enough to be alarming.

People assume there is nothing to worry about. Everything is being adequately taken care of by health authorities—all of which is precisely the attitude which should not be created. The larger number of persons we can interest in public health to the extent of doing something about it, the swifter progress we shall make.

It is probably all right for the state departments and large insurance companies to emphasize the stupendous saving of lives effected by their public health activities. But how are health officers to secure funds for their work when the big boys save so many lives on paper?

There is another angle from the standpoint of news releasing by insurance companies. The lay reader fails to appreciate the point that such figures are not on an actual cross-section of the population, but are on policyholders who constitute more or less selected risks. As far as the lay reader is concerned, statistics from the state and Public Health Service, and from the insurance companies are identical.

In the publication of statistical news, I feel health officers could assist in adding local color and educational value

in the following way. If, instead of sending a release direct to the press, the large organizations would forward it first to the health officer, he could determine whether or not that particular time were the opportune time to publish it, and if so, add figures and suitable material for his community.

It seems logical that lay readers are likely to assimilate a more enlightening and useful bit of information when statistical news of a nation-wide and state-wide character is accompanied by items relating to their own corner of the world. This is on the assumption, naturally, that the health officer will present his share as well written as the others, and that he will calculate sickness and death rates on the same scale or at least with variations explained so as not to confuse readers.

You will gather from this paper that I would like to see put into effect a concurrent and well devised system of releasing statistics by the national, insurance, and private agencies and the local health departments. Statistics, being as they are a highly complex and technical subject, need to be given the public in small, timely and wisely measured doses. They are meagerly understood except by the small group who specialize in their study. Why should that group flourish before the eyes of the rank and file figures and facts which mystify but do not benefit them?

After all, public health education is the only worthwhile reason for publishing statistics for the mass. And the group of persons skilled in the art of presenting statistics educationally is as small as the group who calculate them. It seems paradoxical that organizations which would not dream of releasing any but the most mathematically correct statistics will, nevertheless, release them unrestrictedly.

What will have taken place in the releases concerning epidemic encephalitis by the time this paper is read I do not know. But I do know that during the first few weeks of St. Louis's unfortunate experience with this disease the newspapers have carried many accounts concerning the number of cases and deaths therefrom. The following is typical of releases from state departments of health:

Figures made public by blank department of health show that for blank number of years blank number of cases and deaths were reported annually from encephalitis. The 10-year average for blank city was blank number of cases and for the remainder of the state blank number. Blank number of cases were reported during the first 9 months of 1933, and blank number for the remainder of the state. On the subject of the apparent increase in prevalence of encephalitis there has been a change in the proportion as compared with that of blank year. Prior to 1931 blank city's cases and deaths exceeded in numbers those reported during such and such a time. So on and on, *ad nauseam*. Twenty-five lines of this ended by the following vague statement: " The cases and deaths have not increased in numbers so that the changes which have taken place in the geographical distribution of encephalitis in blank state do not appear to be of any special significance."

The gist of this release could have been told in 12 words, thus: Cases of epidemic encephalitis are not on the increase in this state. The remaining 23 lines could have been utilized to brief for the reader what he actually needs to know—*i.e.*, the symptoms of the disease and what precautions if any he could take against it.

It is because of inappropriate stuff such as this, as well as the unseasonableness of many statistical releases, that I believe we need a new and better system. Such system would be directed toward making statistics not mere idle

news, but an essential part of public health education.

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DISCUSSION

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DR. Shelley represents, I regret to say, a comparatively small but rapidly increasing minority of health officers in New York State who appreciate the desirability, nay, the necessity of the use of publicity in order to accomplish their objectives and maintain a successful fight against opposing local forces. He is a frequent, adept, and welcome user of statistics and other data compiled by the State Department of Health. He knows what he wants to use and how to use it to best advantage. He is right that health authorities are far behind commercial agencies in this matter. We must learn to adopt such of their methods as are ethical if we are to sell health promotion and disease prevention methods to the public.

I do not altogether agree that newspapers will allot so much and no more space to news in the public health field. The amount of space they will give free depends on the amount of live, up-to-the-minute news that can be produced. That is what establishes the limits—not the available newspaper space. But this brings up the question, why should not health agencies, official or otherwise, buy advertising space? It is effective and is a legitimate charge.

I am inclined to disagree also as to which news release a local newspaper would take—one from the local health officer or one from the state, or the Metropolitan Life Insurance Company. A local newspaper wants local news first of all. Again, it depends on the facts and how they are presented. An attempt should be made to localize general stories whenever possible. When this is done, it is almost sure to receive good publicity.

Regarding the statement relating to playing up favorable facts on mortality and morbidity—if the general health trend is favorable, you can do no less than tell the public the true situation. On the other hand, constant playing on the unfavorable side alone soon produces the reaction of crying "Wolf! Wolf!" The newspaper, in fact, is always looking for the alarming facts and will play them up to the exclusion or partial eclipsing of the favorable points.

I would, myself, like to see a more coördinated system of health news releases, but see little hope for it in the near future.

Dr. Shelley criticises an encephalitis release by a state department of health. While he mentions no names, I admit that I edited and published it. His quotation, however, is practically verbatim from our weekly bulletin, *Health News*, which is published primarily for health officials and other health workers. When it appeared in release form, it opened, exactly as Dr. Shelley recommends, with a statement that there is as yet no evidence of any epidemic of lethargic encephalitis in New York State and that the prevalence

of the disease in the state had remained low thus far.

With his further suggestion that an outline of symptoms should have been substituted for statements relating to the comparative number of cases in the state, I certainly do not agree. Since the cases were few and no epidemic existed why unnecessarily alarm the public with a list of symptoms—useless information which the newspapers would not print under existing circumstances.

Work of the National Children's Bureau in Costa Rica

THE National Children's Bureau of Costa Rica, established in 1930, has been laying a foundation for a comprehensive system of social aid, as described in its recently issued second annual report. Several months ago the Bureau took a census of working children, particularly those in street trades; work permits and attendance at afternoon or evening schools were made compulsory for working children; and through a corps of social workers contact was established with the families of working children and of other children in need of attention. The Bureau was instrumental in the enactment of child labor regulations, and it is now enforcing these regulations. A register is kept of the children engaged in street trading and in habitual begging; each case of begging is investigated, and measures for dealing with this problem in general are studied.

The Bureau has made a survey of the neglected children and has been active in the enforcement of the school attendance law as regards these children.

The Children's Bureau exercises supervision over the institutions for dependent, neglected, and delinquent minors. Among those institutions may be mentioned orphan asylums, reformatories for boys and girls, institutions for homeless or neglected girls, child health centers, children's clinics, school lunches, a day nursery, and a vacation colony for school children.

The law requires the Children's Bureau to exercise protection over the health of mothers and children, and the Bureau has already formed plans for such work.

In compliance with another law, the Children's Bureau sends representatives to testify in all court cases involving minors. It also drafts child welfare bills. The Children's Code was passed by the Costa Rica Congress soon after its introduction and is now in effect. Other bills are pending.—*Boletín del Patronato Nacional de la Infancia*, San José de Costa Rica, 3, 16–18, 1933.

Safeguards in the Publicity Use of Vital Statistics*

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THERE are a number of witticisms, now worn rather threadbare, concerning the veracity of statistics and their users, which, in company with most statisticians, I should prefer to ignore in this paper. It does, however, seem desirable to allude to them, partly because they are sometimes quoted to the wrong effect, but mainly because they call attention to certain issues that merit discussion.

The first of these aphorisms, possibly from the pen of Josh Billings, says that "Figgers don't lie; but liars figger." This accusation was, no doubt, originally intended for gentry of the type of the gold-brick salesman, whose "statistics" were written on cuffs and the backs of envelopes for the benefit of his intended victim; but it is true that the charge of fallacious "figgering" applies also with considerable force to a large group of well intentioned persons.

What often happens is that an individual becomes possessed of a given conviction, and wishes to bring others to the same view; but it is not always very convincing for the propagandist simply to say: "It is my belief and that of my associates," so he seeks statistical support for his message. Statistics are complex in their meaning; Yule has appropriately defined them as numbers affected by a multiplicity of factors. This means, for example, that the death rate of a city depends upon the age, racial, and vital state of its inhabitants; industrial, economic, and climatic conditions; medical care, public health supervision, hospital facilities, and certain distorting factors which will be alluded to later. Descriptions of other social phenomena are equally complex, whether numerical or not.

To reason correctly from such complex data is not easy, and even the most acute and careful persons will at times fall into error in the process. But no confusion can be quite so profound as that of the individual who rushes into this maze with the intention of finding support of a preconceived idea. It is truly remarkable how, under the influence of a desire to prove an *a priori* conclusion, the critical faculties of persons of honest intentions can become benumbed so that faulty data and insufficient reasons will pass muster, if favorable to the cause of the searcher, whereas antagonistic evidence will often be ignored, upon one pretext or another.

A number of years ago the writer began keeping a file of statistical errors encountered in medical and public health publications, in the hope that their analysis might be of help in his teaching. Although there are some disadvantages to the method of teaching truth by presenting error, it will perhaps be helpful to give a few examples from

* Papers from the Department of Biostatistics, No. 189. Read at a Joint Session of the Vital Statistics and Public Health Education Sections of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 11, 1933.

this morgue of statistical errors, to bring out certain points of this paper. As the mistakes are of a type that might and do occur to any one of us, it would be rather unfair to publish the names of the few authors who happen to fall into this particular selection; the names will, therefore, be omitted from this paper, except that I admit that one of the mistakes is my own. The first example illustrates a pitfall that has trapped more than one writer:

Example 1—A public health writer states: "In Chile, in 1911, 6 children died during the first year of life out of 20 born; . . . in New Zealand, . . . only one in 20 died. In the last named country each infant had six times as many chances to survive, as did an infant in Chile."

The statement that because the proportion who die is reduced to 1/6 of a given value, the proportion who survive is multiplied by 6 is incorrect; it is comparable to a claim that if a frugal housewife reduces the wastage in her apple parings to 1/6 of the original parings she will multiply her yield of apple-sauce by 6, which claim would, of course, be nonsense. Actually, since in New Zealand 1 died out of 20 born, 19 must have survived; and since, in Chile, 6 out of 20 died, 14 must have survived. The chances of surviving were therefore, in the ratio of 19 to 14, or 1.35 to 1, and not 6 to 1, as the author stated. Incidentally, even the 35 per cent advantage of New Zealand was abundantly worth while; the unconscious exaggeration was as unnecessary as it was incorrect.

The example is cited to illustrate the insidiousness of the friendly or dramatic statistics. Presumably, the author of Example 1—a man of exceptional abilities—merely did not stop to inquire into the true relationship between mortality and survivorship. If, however, the comparison had clashed with his views; if, for example, it had indicated that the nation with the more advanced health administration had the poorer survivorship rate, the statement probably would have been challenged, and the error promptly detected.

Public health certainly aspires to as high an ideal as is professed by business: Truth in Advertising. To that end, the first safeguard proposed in the publicity use of statistics is to try to be more critical of the materials and of the reasoning which favor our cause, than of those which oppose it—*more* critical, because otherwise we shall certainly not be critical enough; the instinct to defend one's beliefs and interests is so strong that desire too often pulls the wool over the eye of reason.

ACCURACY OF STATISTICS

Although the epigram imputed to Josh Billings exonerated the figure and indicted the figurer, some unknown person said, "There are three kinds of lies: lies, damn lies, and statistics." It is, of course, important to draw a distinction between, say, the figures collected by a disinterested governmental agency, and the estimates of the newspaper reporter, the enthusiast, and the partisan.

I was once greatly cheered to hear a statistician engaged in social surveys say that he longed for data that were as complete and accurate as registration returns, such as vital statistics; nevertheless, our field does have inaccurate statement and incomplete registration to contend with. Besides these difficulties are some that arise from classification, *e.g.*, as to residence and cause of death. The residence distortion is by far the most important. As an extreme example, DePorte [1] mentions that the recorded death rate for the rural part of Dutchess County, N. Y., was more than 10 times the true resident rate, due to the presence of many hospitals and institutions.

It should be emphasized that statistics can be very useful in spite of

their inaccuracies, if used with due regard to their limitations. The current encephalitis reports, for example, may be in error by 25 or 50 per cent; yet they convey an important message. As distortions will ordinarily vary more from place to place than from year to year, it is sometimes preferable, if practicable, to make comparisons between different years than between different places.

There is an enormous difference in the trustworthiness of vital statistics of various sorts. In some instances, the compilers of these statistics have, or could obtain, tolerably good information as to the accuracy of specific statistics, and it is a great pity that this information is not oftener passed on for the benefit of the user of the statistics, for without it the statistics can indeed be most misleading.

Registrars and others are constantly laboring to improve the accuracy of their statistics, and this activity is laudable and should be encouraged. But, in my opinion, the greatest need before the vital statistics profession today is that of measuring the accuracy of their statistics, and of placing the results before those who use them. One may ask, "How can the accuracy be known if the true statistics are not known?" The answer is that the accuracy of the count may sometimes be determined from a more precise count of samples, or from related statistics of a higher order of accuracy. Examples of the determination of accuracy have been published (Refs. 2 to 7), but the ground has hardly been scratched.

For the user of statistics the second safeguard here suggested is to know the origin, meaning, and accuracy of the statistics used, or to go to some one who does know.

NUMERICAL ADEQUACY OF STATISTICS

For want of space, this subject can hardly be more than mentioned. It is treated in most textbooks under such headings as probable error and sampling. To the casual user of statistics the following simple suggestion may perhaps be of value: An increase in the tuberculosis rate from, say, 50 to 60 per 100,000, may or may not be noteworthy, depending upon the size of the population involved. Thus, for a city of 1 million, the rates cited would imply a change from 500 to 600 deaths, *i.e.*, an increase of 100 deaths, which no sensible person would take lightly. But for a city of 10,000 the change would be only from 5 to 6 deaths. No smaller increase could be stated; the difference, although equal to 20 per cent, is clearly of little moment.

It is an excellent precaution, thus, to look at the *number* of cases, deaths, etc., as well as at the rates.

REASONING AND STATISTICS

We turn finally to a consideration of the logic associated with statistics. It was Thomas Carlyle [8] who wrote: "A witty statesman once said that you might prove anything by figures." Carlyle was referring at the time to the inaccuracy of statistics, but a powerful inciting cause of the epigram today is certainly the loose reasoning that sometimes goes with the statistics, particularly the form of statement designated by Kant as *post hoc, ergo propter hoc*—after this; therefore because of this.

The basic difficulty behind very many errors of statistical reasoning is, I think, the tendency to consider only one, or a few, instead of all of the important factors that might affect a result. Let an example illustrate:

Example 2—An epidemiologist once went to his health officer with the statement that a certain group of beginning typhoid cases were doubtless attributable to oyster infection, since some 80 per cent of the cases gave history of having eaten raw oysters. "But," objected the health officer half jokingly, "100 per cent of them drank the city water!" (The health officer's jest had more point than he thought at the time; for it later became

apparent that the year before, there had been a small oyster-borne epidemic, and a small water-borne epidemic, concurrently.)

The epidemiologist was, of course, logically justified in suspecting oysters, but his case, as he presented it, savored strongly of *post* oysters; *ergo propter* oysters. The fact that oysters *might* have been responsible was no evidence that they *were* solely, or mainly responsible, and not water, milk, or other vehicles of infection. It is a fundamental theorem of scientific procedure that a given explanation cannot logically be accepted as the preferable one, unless all other reasonable hypotheses have been eliminated.

Statistical logic ordinarily improves as it approaches that of the experimental method, and the use of control populations. To revert to the last example, the hypothesis of oyster infection was more firmly established, when it was shown that the attack rate was enormously higher among consumers of Oyster A, than among controls, composed of consumers of any other brand of oyster distributed in the city. Elimination of other likely agencies of infection completed the case.

Out of the study of published errors came the interesting and constructive suggestion, that a large majority of the fallacies occurring in the use of statistical material would be avoided, if the components of even the simpler types of rates were more generally recognized, and some fairly elementary precautions taken concerning them. Even persons with extensive statistical experience sometimes come to grief for want of these precautions; the examples of this paper support this statement. In connection with ordinary time-rates, such as the death rate, it is necessary to think not only of the deaths or cases, but also of the total population universe involved, *i.e.*, the population at risk. Other important factors, though not all, are the duration, and intensity of exposure to risk. Let an example illustrate the importance of focusing attention on the population at risk.

Example 3—In an examination of candidates for auto drivers' licenses, it was asked "Are accidents more frequent on rainy days than on sunshiny days: Why?"

Many persons answer that rainy days have more accidents, because of slippery roads, lower visibility, etc. Actually, however (as the examiners point out), there are more accidents on sunshiny days, the chief reason being that there are more persons in cars and on the streets on pleasant days; in other words, the population exposed to risk is larger. Another factor perhaps is that on clear days people drive less cautiously.

The next example emphasizes in another way the importance of giving thought to the population exposed to risk.

Example 4—During the decade 1910 to 1920, the mortality rate from malaria increased in the registration area about 50 per cent. Does this mean that the risk of dying from malaria in the United States really increased by that proportion?

It does not, even assuming that the accuracy of diagnosis remained unchanged during the decade. The registration area increased during 1910–1920 from 21 to 34 states. The original states were almost all in the North, and the subsequently added ones mainly in the South, where malaria is most prevalent; the addition of these malarial states caused the rate in the total to rise, hence the malaria rate in the total area rose with time. The example illustrates the importance of bringing compared populations into conformance on essentials. Not only climate, but age, race, sex, etc., should usually be considered in this precaution of making the exposed to risk populations reasonably comparable.

The last example will illustrate the importance of selecting the particular

rate which is capable of answering the question under discussion.

Example 5—It was pointed out that during recent years, the death rate for the age group 1 to 4, had declined more rapidly than had the death rate under age 1. Subsequently, another individual pointed out that this seemed to indicate the futility of infant welfare work, since the age zone of greater welfare activity showed the smaller decline in mortality.

The second person's confusion was partly due to a convention in vital statistics practice that is sometimes troublesome; namely, that of taking as the standard unit, all mortality under age 1. There are operative in that age zone two very different sets of forces for mortality. During very early infancy—certainly under 1 week of age—the dominant mortality factors are essentially congenital or prenatal. Later, however, the environmental factors enter more largely—care, feeding, and the like. Against these environmental forces, the public health campaign has, thus far, apparently been much more successful than against congenital factors. As the deaths of the first day of life, alone, now constitute, in large cities, nearly a fourth of the mortality of the entire first year, it is clear that the ordinary infant mortality rate is loaded with a heavy weight which tends to mask the effect of the life savings in the later months of infancy.

One moral from this is to refer oftener to infant mortality in several subdivisions under age 1; and if a single infant mortality rate is to be referred to, often it had best be the mortality at ages of infancy after 1 month, or possibly after 1 week.

We have seen that in each of the examples cited there was confusion with one of the several elements of a rate. In the Chile-New Zealand example the meaning of the so-called numerator population—survivors—had apparently been mistaken; in the oyster typhoid example, the population at risk had not been contrasted with control populations; in the auto accident example the population at risk had been ignored entirely. In the malaria example, important changes had crept into the population at risk—changes which the uninitiated might easily have overlooked.

The fundamental question concerning any rate or index is: "Does it really measure the risk which we wish to discuss?" To answer this question we must scrutinize, not one, but all of the elements that enter into the rate. We have seen that in practice, fallacy hinges exceedingly often to the population universe, *i.e.*, the population in which the cases, deaths, etc., occur. It is therefore extremely important to ask: To what extent is this population really exposed to the risk under consideration? Is it suitable from the standpoint of age, race, climate, occupational hazards, and so on? Is the population large enough to be representative?

Almost anyone will, I am confident, take a long step toward the sounder use of statistics, if he will analyze in this way the elements of, say, 25 rates encountered in his reading, defining clearly each element of the rate, and evaluating its adequacy for the purpose at hand.

In summary then the following safeguards have been suggested, in the use of statistics for publicity, or otherwise. There are, of course, others of importance which cannot be discussed in a brief paper.

1. Try to be more critical of that which favors your viewpoint than of that which opposes it.

2. Know the origin, meaning, accuracy and sufficiency of the statistics used.

3. Scrutinize, not one, but all of the elements of the rates used; give particular study to the population at risk.

4. Avoid the *post hoc* method of argument: try instead to approach the experimental method, including the use of control populations.

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Prenuptial Health Centers in Uruguay

CENTERS for the physical examination of persons intending to marry, called prenuptial health centers, were established in Montevideo, Uruguay, several months ago. A little later the National Council of Public Health, an official body, ordered that such a center be established at the earliest opportunity in each rural hospital or medical-aid station in the country. Measures for familiarizing the public with the work of these centers were also prescribed.

In the examinations particular attention must be paid to venereal diseases, tuberculosis, and certain other diseases, transmissible or hereditary. A person free from such diseases is given a health certificate; otherwise no certificate is issued. The certificate must be presented to the registrar of marriages and must be noted on the marriage record. If no health certificate is presented, the registrar must suggest a physical examination, although the examination is optional.

The physician in charge of each center is required to report at certain intervals to the prenuptial health center in Montevideo, which is to supervise the work of all the centers.—*Boletín del Consejo de Salud Pública*, Montevideo, 1933, 2, 7, Diario Oficial, Montevideo, 1933, No. 7978.

Evaluation of Diphtheria Toxoid Preparations and Methods of Immunization

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DIPHTHERIA toxoid, since its modification by Ramon, has won wide acceptance and is replacing toxin-antitoxin as an immunizing agent against diphtheria. Realizing that the trend was toward toxoid we felt justified in attempting to ascertain which available preparation produced the most satisfactory results. The preparation containing the undissolved precipitate produced by the addition of 2.5 per cent alum introduced by Havens was not yet available when this work was started.

In our study of 1,978 children, 90 per cent of whom were under 10 years of age, all work was done and results evaluated by ourselves, thus preserving the same personal equation throughout the study.

Points investigated:

1. Minimum dose of toxoid consistent with efficacy and the number of injections required
2. Comparative time required to develop immunity
3. Local and general reactions
4. Possibility of the use of a new preparation offering a simplified and shortened immunization procedure

All groups were composed of children who gave no history of previous immunization and whose preliminary Schick tests with controls were positive.

Children, divided into 4 major groups, were given the following:

1. New York City Department of Health toxoid, 8½ antigenic units per c.c. to 461 children
2. The same preparation, to which 0.2 per cent of alum was added, to 712 children
3. Michigan Department of Health toxoid, 7½ antigenic units per c.c. to 576 children
4. A preparation of concentrated toxoid furnished by the Michigan Department of Health, 30 antigenic units per c.c. to 229 children

A part of each major group was given 1 c.c. and another ½ c.c.; these in turn received one, two, or three injections. A final Schick test was given in each group 1, 2, 6, and 12 months after the last injection of toxoid. Local and general reactions were studied in every group.

NEW YORK CITY HEALTH DEPARTMENT TOXOID WITH AND WITHOUT ALUM

Glenny considerably improved the antigenic value of toxoid by the addi-

tion of 0.2 per cent of alum. Park and Schroeder reported good results in their study of 250 children.

At the suggestion of Park a further study of the relative value of toxoid with and without alum was undertaken and results were observed on 1,173 children.

One injection—The results of only one injection of ½ c.c. or 1 c.c. of toxoid either with or without alum were not satisfactory, as may be seen by the following tabulation:

NEGATIVES EFFECTED BY 1 INJECTION

Interval since last injection	With Alum		Without Alum	
	½ c.c.	1 c.c.	½ c.c.	1 c.c.
2 months	44%	47%	38%	40%
12 months	58%	61%	55%	57%

Two injections—Two injections both with and without alum showed remarkable improvement over those of one injection.

NEGATIVES EFFECTED BY 2 INJECTIONS

Interval since last injection	With Alum		Without Alum	
	½ c.c.	1 c.c.	½ c.c.	1 c.c.
2 months	77.3%	88.8%	70.8%	85.5%
12 months	92.1%	94.3%	90.1%	93.1%

Three injections—Three injections of toxoid both with and without alum showed a slight improvement over two injections.

NEGATIVES EFFECTED BY 3 INJECTIONS

Interval since last injection	With Alum		Without Alum	
	½ c.c.	1 c.c.	½ c.c.	1 c.c.
2 months	94.7%		89.6%	92.3%
12 months	100.0%		93.5%	95.6%

Three 1 c.c. injections were not given because three ½ c.c. injections effected 100 per cent immunity.

CHART I

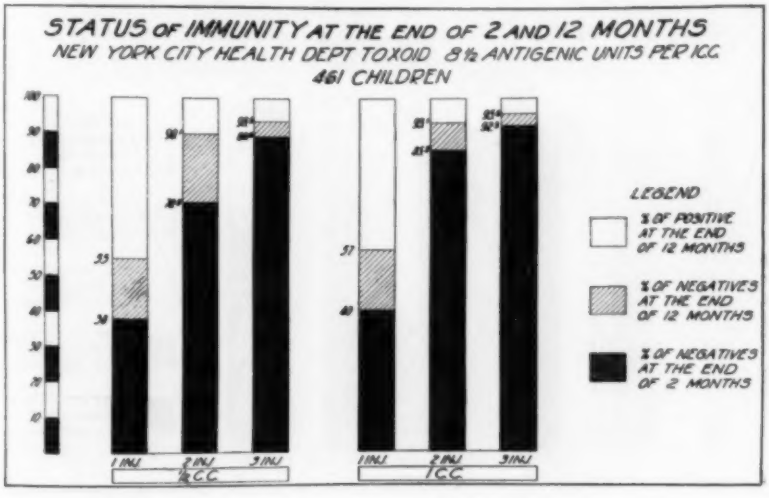
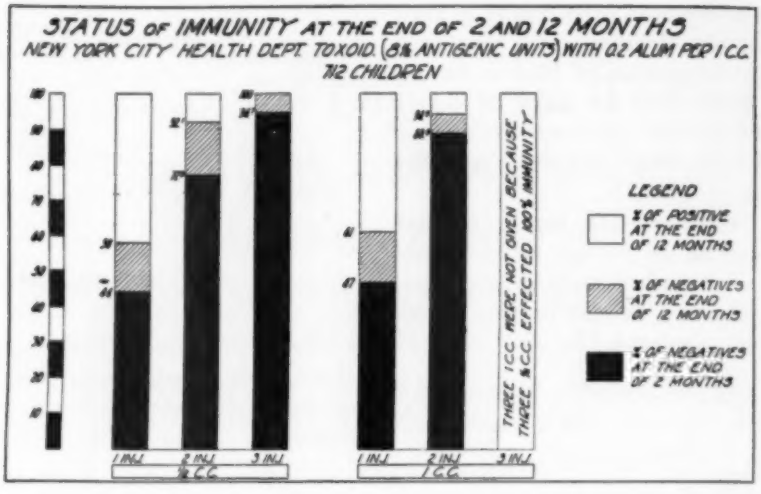

STATUS OF IMMUNITY AT THE END OF 2 AND 12 MONTHS
NEW YORK CITY HEALTH DEPT TOXOID 8½ ANTIGENIC UNITS PER ICC.
461 CHILDREN
LEGEND
% OF POSITIVE AT THE END OF 12 MONTHS
% OF NEGATIVES AT THE END OF 12 MONTHS
% OF NEGATIVES AT THE END OF 2 MONTHS
1 INJ
2 INJ
3 INJ
½ C.C.
1 C.C.

CHART II


STATUS OF IMMUNITY AT THE END OF 2 AND 12 MONTHS
NEW YORK CITY HEALTH DEPT. TOXOID (8% ANTIGENIC UNITS) WITH 0.2 ALUM PER 1 C.C.
712 CHILDREN
THREE 1 C.C. WERE NOT GIVEN BECAUSE THREE 1/2 C.C. EFFECTED 100% IMMUNITY
LEGEND
% OF POSITIVE AT THE END OF 12 MONTHS
% OF NEGATIVES AT THE END OF 12 MONTHS
% OF NEGATIVES AT THE END OF 2 MONTHS
1 INJ.
2 INJ.
3 INJ.
1/2 C.C.
1 C.C.

Both preparations of toxoid used in the above study had the same antigenic potency and both groups of children were comparable in every respect.

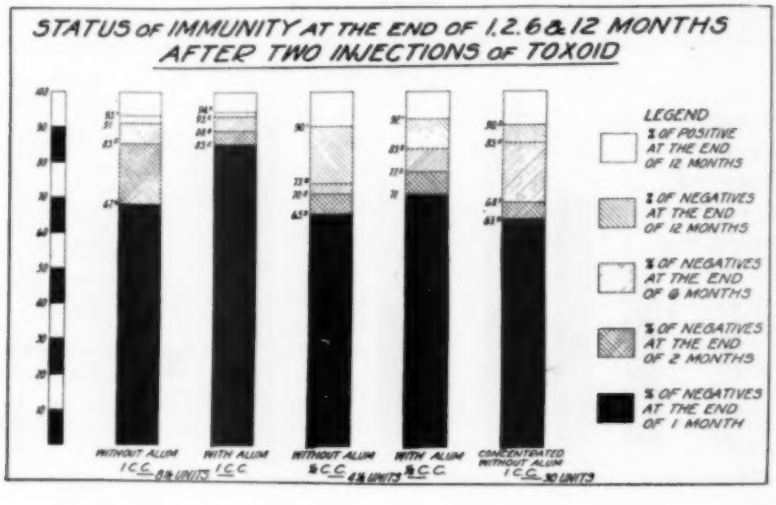
The stability of toxoid with alum was shown by the fact that half of our lot was stored for 7 months and results were slightly better from the older preparation than from the fresh.

A comparison is shown in Charts I and II of the results obtained by one, two, and three injections of toxoid with and without alum.

A higher degree of immunity is developed more rapidly by toxoid with alum than by toxoid without alum, a point of considerable importance at all times and particularly when diphtheria is prevalent in a community. The percentage of negatives obtained with two injections differs little from that obtained with three, and as the two injection procedure is simpler, we prefer the two injections of toxoid with alum.

Chart III shows the highly satisfactory results of two injections both with

CHART III


STATUS OF IMMUNITY AT THE END OF 1, 2, 6 & 12 MONTHS
AFTER TWO INJECTIONS OF TOXOID
LEGEND
% OF POSITIVE AT THE END OF 12 MONTHS
% OF NEGATIVES AT THE END OF 12 MONTHS
% OF NEGATIVES AT THE END OF 6 MONTHS
% OF NEGATIVES AT THE END OF 2 MONTHS
% OF NEGATIVES AT THE END OF 1 MONTH
WITHOUT ALUM 1 C.C. 8 UNITS
WITH ALUM 1 C.C.
WITHOUT ALUM 1/2 C.C. 4 UNITS
WITH ALUM 1/2 C.C.
CONCENTRATED WITHOUT ALUM 1 C.C. 30 UNITS

and without alum and the trend of development of immunization 1, 2, 6, and 12 months after. One c.c. doses produced better results than ½ c.c. doses with but a slight increase in local reaction.

MICHIGAN TOXOID

Results from the Michigan Department of Health preparation of toxoid containing 7½ antigenic units, were observed on 576 children.

One injection—The results of one injection of ½ c.c. or 1 c.c. of toxoid were not satisfactory:

NEGATIVES EFFECTED BY 1 INJECTION

Interval since last injection	½ c.c.	1 c.c.
2 months	40%	42%
12 months	57%	61%

Two injections—The use of two injections of toxoid showed considerable improvement over one injection. One c.c. doses effected a slightly higher percentage of negatives after the 12th month:

NEGATIVES EFFECTED BY 2 INJECTIONS

Interval since last injection	½ c.c.	1 c.c.
2 months	71.0%	71.9%
12 months	82.3%	86.4%

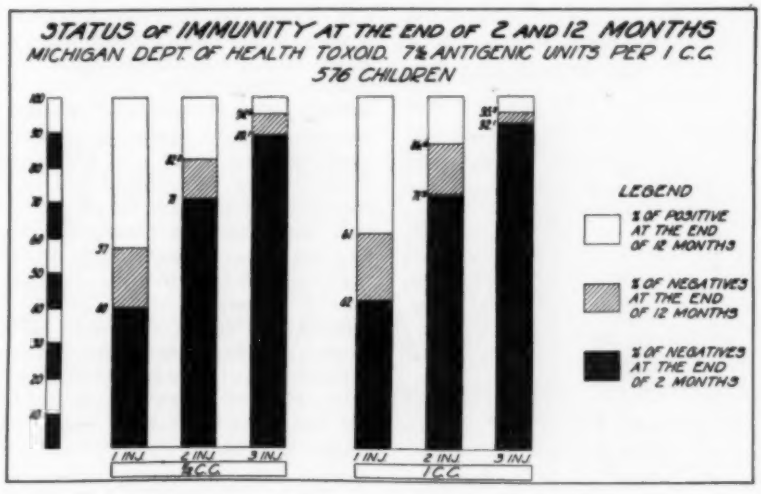
Three injections—The use of three injections of toxoid showed considerable improvement over two injections. Apparently three ½ c.c. injections are as effective as three 1 c.c. injections:

NEGATIVES EFFECTED BY 3 INJECTIONS

Interval since last injection	½ c.c.	1 c.c.
2 months	89.1%	92.1%
12 months	94.9%	95.2%

Results from one, two, and three in-

CHART IV


STATUS OF IMMUNITY AT THE END OF 2 AND 12 MONTHS
MICHIGAN DEPT. OF HEALTH TOXOID. 7½ ANTIGENIC UNITS PER 1 C.C.
576 CHILDREN
LEGEND
% OF POSITIVE AT THE END OF 12 MONTHS
% OF NEGATIVES AT THE END OF 12 MONTHS
% OF NEGATIVES AT THE END OF 2 MONTHS
1 INJ
2 INJ
3 INJ
½ C.C.
1 C.C.

jections of Michigan Health Department toxoid are shown in Chart IV.

It is well known that numerous visits in connection with the immunization of a child undoubtedly prevent the family physician from becoming paramount in the immunizing problem. Until toxoid is perfected, this disadvantage might be overcome to some extent by the following procedure which we used with satisfactory results on 210 children:

The Schick test was given and, if no history of previous immunization was elicited, an injection of toxoid was given at the time of the first visit. The Schick test was read after 1 week and if positive, the second injection was given.

MICHIGAN CONCENTRATED TOXOID

At the suggestion of Young we studied the results of using a concentrated toxoid containing 30 antigenic units per c.c. on 229 children. Only two injections of the concentrated toxoid were given.

As shown in Chart III, the use of two 1 c.c. injections of concentrated toxoid resulted in a lower percentage of Schick negative children than two 1 c.c. injections of regular toxoid.

REACTIONS

In evaluating the degree and frequency of reactions a questionnaire was sent to the parents of each child immunized, requesting them to describe the nature, degree, and duration of the reactions either local or general. Redness, swelling, and pain were listed under local reactions; and headache, general malaise, nausea, vomiting, fever, and skin eruptions under the heading of general reactions.

Letters were sent to the parents of 1,456 children from whom 972 replies were received. The parents of 34 per cent failed to report, probably because no reactions were apparent.

As reactions were observed only by the parents, interpretations are perhaps not perfect, though it is reasonably certain that severe reactions were correctly reported.

Chart V shows a detailed tabulation of reactions. Toxoid with alum gives 7 per cent of moderate and severe general reactions as compared to about 4 per cent from the same preparation without alum. Moderate and severe local as well as general reactions were 3 times more frequent from concentrated toxoid than from any other preparation.

Ray, Janney, Schwartz, and others report a few instances of the development of asthmatic attacks after receiving toxoid, probably due to sensitiveness to diphtheria proteins or veal broth used in the growing of diphtheria bacilli.

In our group we observed one attack of severe character:

March 10, 1932, a boy age 10, had a Schick test with control. Reading 1 week later was positive. April 27, the child received the last injection of ½ c.c. of toxoid without alum, followed by no local or general reaction. June 2, the child received the final Schick test. One-half hour later the lips and eyelids became swollen, the child became cyanotic and short of breath. Urticaria appeared over the entire body. The attack was relieved by adrenalin.

A similar attack was observed in a child of 3 years of age who received the Schick test in the Health Department office. Within 10 minutes the child suddenly developed urticaria all over the body, extreme restlessness, shortness of breath, cyanosis, coughing, vomiting, swelling of the eyelids and lips. Adrenalin was administered and repeated in the course of the next 15 minutes. The attack lasted over an hour. The history of this child is as follows: July 16, 1932, the preliminary Schick test was positive; subsequently he received two 1 c.c. injections of concentrated toxoid, the last being given August 23, 1932. Schick tests were given in September, and October, 1932, and in February, 1933, all of which were positive. The last which precipitated the attack was given August 12, 1933.

These attacks following the administration of the Schick test caused great

CHART V

TABULATION OF REACTIONS FOLLOWING ADMINISTRATION OF TOXOID

Preparations Used		New York City Health Dept. Toxoid				Michigan State Health Dept. Toxoid			
		With Alum		Without Alum		Regular		Concentrated	
Dose		½c.c.	1 c.c.	½c.c.	1 c.c.	½c.c.	1 c.c.	½c.c.	1 c.c.
Antigenic Units per Injection		4¼	8½	4¼	8½	3¾	7½	15	30
Number of Reports Received		186	129	112	113	235	101	18	78
Percent Reporting No Reactions		29	28	37	26	32	33	28	15
Percent of Local Reactions	Mild	67	67	59	65	60	63	55	61
	Moderate	6	7	3	8	3	3	17	21
	Severe								
Percent of General Reactions	Mild	27	28	15	20	15	12	28	17
	Moderate	6	6	4	3	1	8	17	18
	Severe		1		1	1		5	6

anxiety for a short time, though they left no sequelae. In the writers' experience with the immunization of 7,000 children these 2 cases stand alone, indicating their rarity. However, the possibility of their occurrence should not be disregarded. Park advances the theory that the toxoid sensitized the children to the material in the last Schick test and that the reaction might have been due to the endo-toxins in the toxoid or Schick toxin. As there is no knowledge of any child ever having died from toxoid or Schick toxin, these occurrences should not prejudice one against retesting. If others have had similar experiences, their publication might lead to a more thorough knowledge of the factors responsible.

CONCLUSION

1. After considerable experience with toxin-antitoxin and toxoid, we are of the opinion that toxoid is preferable because it produces a higher degree of immunity in a shorter time. As a result of our previous study of 1,282 children, four injections of toxin-antitoxin gave 74 per cent of Schick negative children at the end of 1 year, while two injections of toxoid with alum gave 88.8 per cent Schick negative at the end of 2 months and 94.3 per cent at the end of 1 year.

2. Toxoid of 7½ to 10 antigenic potency was preferable to the preparation of concentrated toxoid used by us.

3. Toxoid with the addition of 0.2 per cent of alum is a preferable preparation because it produces a higher degree of immunity as determined by the Schick test in a shorter time than any other used in this study.

4. It appears that three 1 c.c. injections of toxoid with alum would be ideal, yet for practical application two injections are sufficient.

5. A 1 c.c. dose produces a slightly

higher percentage of reactions than a ½ c.c. dose but produces a higher degree of immunity.

The slightly higher frequency of local reactions from toxoid with alum should not be an objection because the reaction is mild and short. Moderate general reactions occurred in 7 per cent of cases.

6. In order to reduce the number of visits to a minimum, injection of toxoid and the Schick test at the same visit is suggested for children over 5 years of age whenever there is no history of previous immunization.

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Essentials of Typhoid Fever Control Today*

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IT cannot be expected that American health workers will take as much interest today in typhoid fever as they did a few decades ago when the disease was 10 times, or in some localities 20 times, as prevalent. In many large cities the reduction in typhoid has been amazing. In Boston, in 1888, the typhoid death rate was over 40 (40.1) per 100,000; in 1932 there was only 1 death in each 200,000 population (0.5 per 100,000). In Indianapolis the typhoid death rate was 190 per 100,000 in 1905, as against 1.6 in 1932. In the face of such figures, interest in typhoid has naturally waned. At the same time we need to remind ourselves that our relative exemption from typhoid today is purchased only through eternal vigilance.

First and foremost in typhoid control comes the safeguarding of the water supply. It was one of the earliest practical triumphs of epidemiology to show that typhoid was often due to contaminated drinking water and could be largely prevented by improving the character of the supply. There can be little doubt that the main factor in the typhoid reduction of the past few decades has been the insistence of sanitarians on pure water supplies. One of the most valuable contributions yet made by American workers to the cause of public health is the demonstration that chlorination of public water supplies is both effective and inexpensive. But for this method of purification there would without question be much more typhoid than there is today.

I am aware that there is a tendency in some quarters to view somewhat indifferently problems of drinking water control and to consider that we have successfully completed the "engineering phase" of public health and are now ready for greater conquests. The expression "environmental sanitation" has come to have almost a derogatory significance in the minds of some, as an outworn creed. It seems to me a misconception of the basis of much of our public health work and indeed of the basis of civilization itself to look upon environmental control as something already over and done with. We stand on a thin crust. It is not enough in a complicated society to start something that looks good and then leave it to take care of itself. Unceasing, meticulous, highly skilled and conscientious attention is as necessary today as ever in preventing water-borne typhoid fever.

Wolman and Gorman have done a great service by assembling in their fine monograph the evidence of the important part still played by water in the causation of typhoid fever, particularly in the smaller communities with populations of under 5,000. In states with a large rural population this is especially evident. In South Dakota, according to

* Read at a Joint Session of the Health Officers, Laboratory and Epidemiology Sections of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 10, 1933.

the water supply survey of 1930, nearly 50 per cent of the municipal water supplies were subject to pollution.

The excellent study by Bostrom, Hunter, and Towne of the epidemic in Chamberlain, S. D., early in 1933, where 247 cases were registered in a population of 1,530, shows that water-borne typhoid may still cause great disaster.

Responsibility for safe water supplies is likely to increase rather than diminish with the ever-growing load of pollution on streams and lakes. Emergencies will arise in the future, as they have arisen in the past, when the best judgment speedily applied will be needed to avoid a great catastrophe. It is always difficult to bring home to the public the fact that something has not happened which would have happened if precautions had not been taken against it. The newspaper reader rarely learns that he is being protected day by day from water-borne infection, but if an epidemic occurs and begins to die out in a natural way he is at once informed that the epidemic is "checked," or "under control," through somebody's heroic activities. Some day it is to be hoped credit will be given where credit is due, and the forgotten engineers and laboratory workers will be recognized as the real heroes whose unremitting labors keep most of us secure from the menace of water-borne typhoid. Environmental sanitation is not something to be laid on the shelf as shopworn and out-dated, but it is an ever-present fierce necessity without which our modern mastery of disease would soon prove to be an empty boast.

Most of the larger communities in the United States are well protected against water-borne typhoid at present by filtration or chlorination or both. Wolman and Gorman have shown, however, that approximately 40 per cent of the outbreaks of reported water-borne illness in the United States during the decade 1920–1929 were caused by defects in the collection, treatment, storage, or distribution of the water, and not by pollution of a raw water at its source. The most important single factor during this period was the inadequately protected cross-connection between the public water system and a polluted auxiliary water service such as is often used for fire protection. It is plain that such cross-connections and similar potentially dangerous conditions should be eliminated wherever possible. Typhoid fever traced to a public water supply usually means that some one has been asleep at the switch.

In the smaller communities much can be done to improve the character of drinking-water supplies by a simple kind of local inspection and by education. Wells must be located with great care. The considerable distance to which bacteria may travel in ordinary soil in the direction of the ground water flow—*but not against it*—has been beautifully shown by Mrs. Elfreda L. Caldwell in experiments conducted under the guidance of Dr. F. F. Russell, Director of the International Health Division of the Rockefeller Foundation. The danger of contamination of the wells and the treacherous springs in limestone regions with their numerous underground water channels is, of course, peculiarly acute. State boards of health serving rural communities are in a position to prevent much typhoid at small expense through competent inspection of the water supplies in small towns and country districts. No longer do the large cities act as typhoid foci from which the disease spreads throughout the surrounding territory. In many localities the majority of the typhoid patients in city hospitals are not city residents but are imported from the neighboring suburban or rural population. The chief reason for this shifting of typhoid incidence from the large population groups to the small ones is

the superior urban control exercised over drinking water.

Thirty years ago raw milk was probably second only to water supply as a vehicle of typhoid infection in the United States. There is no need to dwell on this fact or on the change that has occurred. The general introduction of the process of pasteurization has all but eliminated milk-borne typhoid in the larger urban centers. To be sure, the extraordinary Montreal outbreak of 1927 is still fresh in our minds, but every one will agree that the conditions permitting that outbreak and its long continuance were in the highest degree exceptional. The value of pasteurization in preventing not only typhoid but a number of other diseases is too well recognized to need special exposition.

As regards milk supply also, the smaller communities are at a disadvantage. Properly pasteurized milk is less easily come by in small towns and villages than in cities, partly for financial reasons connected with the existence of a relatively large number of small milk supplies. It would seem probable that improvement might be effected through some form of unification, but I am aware that this is a difficult and delicate problem. It is encouraging to note that the practicability of municipal pasteurization plants for small towns is being discussed with a view to some form of organization making it possible for distributors to exchange at a central plant their raw milk for pasteurized milk each day, going on to deliver the bottled pasteurized milk to their customers. The use of federal loan funds for the construction of such small plants has been suggested.

As is well known, other raw foods besides milk may sometimes be vehicles of typhoid infection. Vegetables commonly eaten without cooking, such as celery, watercress and lettuce, have been occasionally incriminated; raw oysters, mussels, and clams have caused typhoid in a number of instances. These sources of typhoid are susceptible of control. Great improvement in sanitary measures in the oyster industry have been made in recent years. Contamination of vegetables may be almost wholly prevented by the avoidance of the use of human excrement for fertilizing truck gardens.

A far more important aspect of food-borne typhoid infection is the contamination of food by typhoid carriers in the kitchen or on the way to the table. Some have proposed to remedy this by bacterial examination of all food handlers in dairies, bakeries, lunch counters, hotels, restaurants, and boarding houses. Apart from the colossal amount of labor and expense involved in routine examination of numbers running running into the tens of thousands in our larger cities and including a rapidly changing personnel, there are certain technical difficulties that make such examination of doubtful practical value. Chief is the well known intermittency of discharge of typhoid bacilli so that a single failure to find typhoid bacilli in the stools of a food handler, and even several consecutive negative results, give no guarantee of safety. Cultures from the bile sometimes give positive results when stool cultures have been negative. In some instances carriers who have been proved to transmit infection, discharge typhoid bacilli only at long intervals over a term of years.[1]

Detection of carriers by bacterial examination has thus far been most valuable in connection with specifically identified sources. There is abundant evidence that in communities where water-borne and milk-borne infection have been practically eliminated, it is carrier infection that keeps the disease alive. Milk-borne infection itself is mainly a problem of carriers. An instance is on record where one and the same carrier apparently gave rise to

typhoid in three different ways, by milk, by contact, and by water contamination.[2]

The effective control of known typhoid carriers is well recognized as a vexatious problem in public health administration. It is a serious matter to take away a family's means for livelihood, or to cause an individual to be looked upon as an outcast by neighbors and friends. Too great severity in supervision may lead simply to shifting the carrier's field of operations. On the other hand, there are unquestionably some cases where indefinite detention of a carrier in a hospital is necessary to protect the public health; this is recognized in the recent revision of the Sanitary Code of the City of New York.

Attempts to cure typhoid carriers by non-surgical means, such as chemotherapy, vaccine therapy, or bacteriophage, have not been generally successful and number few advocates at the present time. Surgical treatment, especially removal of the gall-bladder, has much to recommend it. In a series of 12 cases recently reported by Bigelow and Anderson,[3] removal of the gall-bladder was apparently followed by complete cure of the carrier condition. In another series studied in New York State removal of the gall-bladder resulted in the apparent cure of the carrier condition in 59 per cent of those from whom required specimens had been submitted. There were no fatalities in 35 carriers who were under 50 years of age at the time of operation, but the mortality in those over 50 was 32.3 per cent.[4] Browning and his coworkers in England[5] have also reached the conclusion that removal of the gall-bladder yields highly satisfactory results. The risks of operation *for persons of suitable age and physical condition* seem to be justified since chronic infections of the gall-bladder are likely sooner or later to affect seriously the health of the carriers. From the standpoint of efficiency and administrative economy this method of dealing with carriers is probably superior to any other.

While the number of registered carriers is a relatively small proportion of the total—in Massachusetts 75 known carriers out of a calculated 1,100 in the state—there is no reason to assume that the undiscovered carriers are equal sources of danger. Some of them undoubtedly never give rise to a single case of typhoid.

It must be remembered also that the carrier problem is in a sense solving itself, that all preventive measures

TABLE I

AGE GROUPS OF TYPHOID CARRIERS

Age Group	*Germany * (220 carriers) per cent 1906–1907*	*New York † (368 carriers) per cent 1911–1932*	*Upstate New York (33 carriers) Numbers 1931*
Under 10	2.7	0.3	0
10–19	4.1	2.6	1
20–29	13.1	6.2	1
30–39	24.1	14.7	4
40–49	23.2	19.0	4
50–59	15.5	23.0	9
60–69	10.9	23.0	10
70–79	2.7	8.2	3
80+	0.9	1.9	1
Unknown	1.8	1.1	

* *Klinger, Arb. a. d. k. Ges.*, 30:584, 1909.
† Senftner and Coughlin, *Am. J. Hyg.*, 17:712, 1933.

automatically reduce the number of carriers. Any decrease in typhoid is cumulatively as well as immediately beneficial. The typhoid carrier is passing off the stage.

Available figures give some evidence of this. I have tabulated (Table I) the age distribution of 220 carriers studied in the first decade of this century during the campaign against typhoid in the southwest of Germany together with that of 368 carriers discovered in New York State (not including New York City) between 1911 and July 1, 1932, nearly all of them in the last 10 years. This comparison (Table I) shows that in 1906–1907 there were many more carriers under 50 years of age than over, while in recent years the reverse is true.

Closely connected with carrier infection is the possibility of infection directly or indirectly from typhoid patients. Although this danger is well known, and nurses and physicians are as a rule measurably protected by vaccination, there is evidence that infection —what used to be called "contact infection"—from this source should be carefully guarded against. Such infection may be easily carried outside the family. In April, 1933, 11 cases with 2 deaths were caused among those attending a church supper in an Illinois town through food contaminated by a mother who had been nursing her son, ill with supposed "intestinal flu," later diagnosed as typhoid. There is no doubt that medical students in large urban centers no longer have a chance to become thoroughly familiar with clinical typhoid and that occasional mistaken diagnoses are not unlikely. Suspected typhoid, as well as diagnosed typhoid, should be at once reported to health authorities.

The responsibility of hospital management in typhoid fever cases is a grave one. So far as I am aware there are no data that indicate how far this responsibility is met, but it must be borne in mind that, as Garbat [6] has shown, the usual routine stool examinations during convalescence may miss 15 per cent of all typhoid carriers, and that 25 per cent of the temporary carriers alone may be dangerous for as long as from 1 to 2 months after defervescence. The infective status of the typhoid patient on his release from the hospital is, therefore, a matter of serious concern to health officials.

Improper disposal of excretal refuse has almost disappeared as an urban problem, and is less urgent than it used to be in country districts as a result of the campaign for sanitary privies. The importance of guarding against transmission of infection by house flies or vermin having access to imperfectly constructed privies has received wide publicity. In certain sections of the country, however, much still remains to be accomplished. The remarkable success that has attended the installation of proper sanitation throughout the island of Jamaica under unusually difficult climatic and economic conditions may well spur us to new efforts in this field.

Prophylactic inoculation against typhoid, as all the world knows, has been brilliantly successful in preventing extensive infection among soldiers and others specially exposed. Its use should be mandatory in asylums and all custodial institutions. All persons exposed by their mode of life, such as physicians, nurses, medical students, laboratory workers, laborers in lumber or construction camps, and travelers in typhoid-ridden countries, should be inoculated against typhoid as a routine practice. Although the protection so conferred is by no means absolute and is known to have been broken down in a number of instances, probably by massive doses of infection, the evidence from comparative statistics is overwhelmingly favorable.

With regard to widespread inocula-

tion of civilian populations, we need more evidence as to the types of vaccines used, and especially do we need full and adequately controlled records before we are in a position to determine the relative value of this procedure as compared with that of more fundamental measures. The recent work of Grinnell [7] on the relative ineffectiveness of the Rawlings typhoid strain as an immunizing agent has been confirmed by Perry and his associates [8] who found that 10 unvaccinated mice all died with the test dose of a virulent typhoid strain, and that 28 died out of 30 mice vaccinated with three different vaccines prepared from the Rawlings strain, whereas only 3 died out of 27 mice that had been vaccinated similarly with a demonstrated smooth strain recently isolated. While caution of course is necessary in applying the results of such experiments to man, there is abundant reason for knowing definitely about the character of the vaccine before embarking upon vaccination "campaigns." Conceivably there are conditions where general civilian vaccination may be hopefully undertaken, but we need more evidence as to its real value. Unless control is exercised in a given area over water supply, excreta disposal, and other well known factors, the results from wholesale vaccination may be disappointing. If these basic sanitary measures are properly carried out, general vaccination may be unnecessary. It is better to put the house in order than to wallow in dirt and then take medicines to ward off the effect of slovenly living.

The general strategy of combating typhoid fever at the present time seems clear. It consists essentially in putting into practice the knowledge we already possess. First, tighten and strengthen the barriers that prevent typhoid bacilli from getting into drinking water or into milk and other foods. Second, in those communities where typhoid has already been reduced to a low point by the application of such measures, investigate the source of each case and minor outbreak and concentrate on the elimination of case infection, and especially carrier infection, knowing that time itself is fighting on our side.

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What Are the Essentials of Typhoid Fever Control Today?*

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THE question "What are the essentials of typhoid fever control today?" carries with it the implication that these essentials are no longer the same as formerly. Although our fundamental conceptions as to the cause and mode of transmission of typhoid fever remain the same, the problem of control is materially different from that of a generation or even a decade ago because of the changes which have taken place in the prevalence of the disease. Since these changes have a direct relationship to prevention, they will be discussed briefly before reviewing the present status of typhoid control.

TYPHOID PREVALENCE

The trend of typhoid mortality during the past 20 years in 11 states, 6 of them in the northern, and 5 in the southern part of the country, is shown in Table I and in the accompanying graph. The northern states are Connecticut, New Hampshire, Maine, Michigan, Minnesota, and Wisconsin, and the southern states include Kentucky, Maryland, North Carolina, Tennessee, and Virginia.* Populations and deaths for places of less than 10,000 population in North Carolina in 1913, and for the State of Tennessee from 1913 to 1916 inclusive, are not included because data for these areas in the years specified are lacking.

The typhoid death rate in the 11 states fell from 21.9 in 1913, to 4.2 in 1932, a decline of 81 per cent. Similar decreases have been observed throughout the United States and Canada (Howard 1932, *Mon. Epi. Rept. League of Nations, 1933*), and although the term "residual typhoid fever" was in common use 20 years ago, there is little indication that death rates in most states and provinces have ceased to decline or have yet approached stationary levels.

That the downward trend of typhoid mortality has been general, and not limited to any one section of the country or population group, is demonstrated by Table II. In this table are given urban and rural typhoid death rates by 5-year periods from 1913 to 1932 inclusive among the white populations of the 5 southern states, and among the total populations of the 6 northern states previously mentioned. Rates among the white populations of southern states are compared with rates among the total populations of northern states because of the low proportion of negroes

* Read before a Joint Session of the Health Officers, Laboratory, and Epidemiology Sections of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 10, 1933.

* According to the 1930 Census, the 6 northern states had a combined population of 13,214,903 persons, and the 5 southern states a combined population of 12,454,798 persons. The density of population for northern states was 56 persons per sq. mi. and that for southern states 69 persons per sq. mi. Fifty-nine per cent of the population of northern states, and 34 per cent of the population of southern states lived in places with 2,500 or more inhabitants in 1930.

TABLE I

TYPHOID FEVER DEATH RATES IN 11 STATES, 1913 TO 1932, INCLUSIVE *

Year	Population	Number of deaths	Death rate per 100,000
1913	16,087,910	3,529	21.9
1914	18,510,750	3,706	20.0
1915	18,784,056	3,159	16.8
1916	19,057,362	3,208	16.8
1917	21,629,131	4,008	18.5
1918	21,918,207	3,222	14.7
1919	22,197,286	2,820	12.7
1920	22,513,653	2,192	9.7
1921	22,837,352	2,681	11.7
1922	23,161,049	2,066	8.9
1923	23,484,746	2,019	8.6
1924	23,808,443	1,888	7.9
1925	24,132,142	2,388	9.9
1926	24,455,838	2,019	8.3
1927	24,779,537	1,696	6.8
1928	25,103,233	1,360	5.4
1929	25,426,932	1,170	4.6
1930	25,750,626	1,343	5.2
1931	26,074,322	1,262	4.8
1932	26,398,018	1,115	4.2

* States included: Connecticut, Kentucky, Maine, Maryland, Michigan, Minnesota, New Hampshire, Virginia, Wisconsin 1913–1932; North Carolina 1914–1932; Tennessee 1917–1932.

in the North. The terms " urban " and " rural " are here used as in *U. S. Mortality Statistics* where places with less than 10,000 population are classified as rural.

Table II shows marked decreases in the urban and rural sections of both northern and southern states. These decreases have been more extensive, and the final rates are considerably lower in the North than in the South. However, although lagging behind northern ratios, the rates in southern states are more than two-thirds lower than they were, the white urban rate in the South having declined 77 per cent, and the rural rate 68 per cent during the 20-year period.

Moreover, typhoid fever mortality has decreased to a remarkable extent even in the smallest and most scattered population groups. Thus, the mean annual typhoid death rate (based on deaths allocated to place of residence) for New York State unincorporated territory from 1913 to 1917 inclusive was 8.0, and the corresponding rate for the same population group from 1928 to 1932 inclusive was 1.5 per 100,000. This decline of 81 per cent is noteworthy since it occurred for the most part in strictly rural districts without public water supplies, and in New York, a state where only a negligible proportion of the population have received typhoid vaccine.

According to a compilation of communicable disease cases made by the U. S. Public Health Service for the White House Conference (1931), the trend of typhoid morbidity has been the same as that of mortality. Taking both morbidity and mortality data into consideration, it appears that, by and large, typhoid fever has decreased in prevalence more than any other common

acute communicable disease with the possible exception of diphtheria. The extent and continuance of this decline have been stressed for two reasons, one of which is to point out that due caution must be exercised in evaluating the results of preventive measures by means of reductions in morbidity and mortality rates. Typhoid case and death rates are falling so rapidly that reductions in a given area cannot be interpreted as directly resulting from any single preventive measure, unless they are significantly greater than those in similar localities where the same measure has not been employed.

A more important reason for emphasizing changes in typhoid prevalence is to make it clear that control of the disease is no longer the object to be attained. Provided decreases can be made to continue at their present satisfactory rate, the complete eradication of typhoid fever is an actual possibility, and is the goal toward which future preventive efforts should be directed.

ENVIRONMENTAL PREVENTIVE MEASURES

That our present favorable typhoid situation has been arrived at largely because improvements in water, and milk supplies, sewage disposal facilities, and other environmental conditions is seldom, if ever, seriously questioned. Certain recent studies afford confirmatory evidence of the association between environmental factors and typhoid prevalence, and serve to demonstrate that the possibilities for further reductions by means of sanitary improvements have not yet been exhausted.

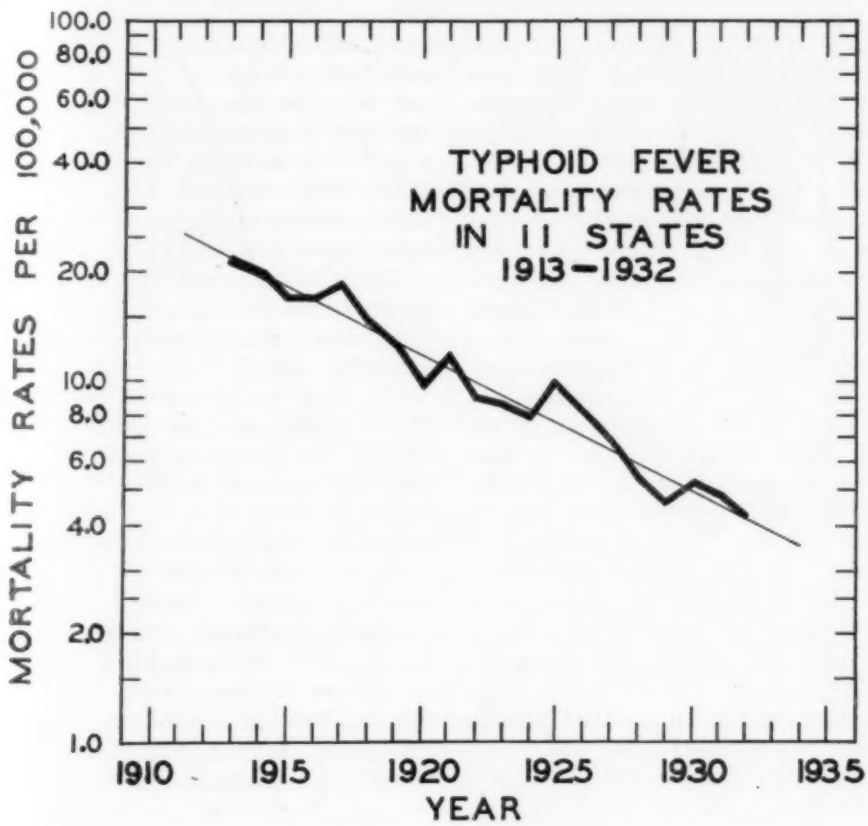

TABLE II

MEAN ANNUAL URBAN AND RURAL TYPHOID FEVER DEATH RATES PER 100,000 IN 6 NORTHERN STATES, AND AMONG THE WHITE POPULATIONS OF 5 SOUTHERN STATES, BY 5-YEAR PERIODS, 1913–1932 INCLUSIVE *

DEATH RATES PER 100,000

Period	Urban		Rural	
	Southern white	Northern	Southern white	Northern
1913—1917	20.8	12.8	27.8	7.5
1918—1922	10.6	5.7	17.6	4.4
1923—1927	6.8	3.0	14.0	2.2
1928—1932	4.7	1.2	8.8	1.3
Per cent decrease	77	91	68	83

* Data 1913–1929 inclusive from U.S. Mortality Statistics
Data 1930–1932 obtained from States by correspondence

Veldee (1931) found that in 6 Ohio river cities typhoid death rates were somewhat reduced by changes from raw water to partially treated supplies, but were not brought down to rates comparable with those in a control group of cities until the water supplies received entirely adequate treatment. It is probable that reductions of the same sort have followed successive water supply improvements in cities generally, these reductions being less striking than those in earlier years, and therefore less commented upon. A large number of New York State water supplies have been improved during the past two decades, particularly in villages and cities of from 2,500 to 25,000 population, the majority of larger cities having had good or fairly good supplies prior to 1913. From 1913 to 1922 inclusive, 24 water-borne epidemics are known to have occurred in the 138 places belonging to the 2,500 to 25,000 population group, whereas during the period 1923 to 1932 inclusive, there were only 6 water-borne outbreaks in places of the same size, no such outbreaks having occurred since 1928. In 1,301 communities with less than 2,500 inhabitants, and with proportionately fewer water supply improvements, there were 14 water-borne outbreaks from 1913 to 1922, and 10 water-borne outbreaks from 1923 to 1932 inclusive.

Doull, Morales, and Haygood (1928) found that in Knoxville, Tenn., typhoid fever was most prevalent among persons who, though living inside the city limits, used privies or outdoor flush closets, and drank water from wells and springs. It is believed that if this survey were repeated in other cities with high typhoid death rates, similar results would be obtained, and that in spite of accessible city water supplies and sewerage systems, large numbers of people drinking spring or well water and using privies would be found.

After an intensive study of recent epidemics, Wolman (1931) gave warning that water-borne typhoid fever is still a menace, and emphasized the necessity for continued efforts to improve the

quality and supervision of water supplies. The same statement should be made with respect to milk supplies, sewage disposal facilities, and other environmental conditions. Environmental preventive measures are still major essentials of typhoid control, and it is certain that these measures have not yet been used to the fullest possible extent, especially in areas where the prevalence of the disease remains strikingly high.

TYPHOID CARRIERS

With the gradual elimination of opportunities for the wide dissemination of the disease by means of polluted water and milk supplies, and other defective environmental factors, typhoid carriers have come into greater and greater prominence, and as sources of infection now occupy, or should occupy, an important place in control programs. The vast majority of carriers are discovered either during investigations of typhoid cases and outbreaks, or as the result of requiring release specimens of feces from convalescent patients.

As regards the discovery of carriers by means of epidemiological investigation, it is clear that success depends upon careful, intelligent case study by qualified personnel. Unfortunately, the ideal of tracing the majority of sporadic cases, and small endemic typhoid foci to carrier infection is scarcely ever realized even in states with the fewest cases and best investigative facilities. Reasons for failure include superficial inquiry as to the circumstances surrounding the case, lack of sufficient numbers of fecal specimens from contacts and suspected carriers, and in some instances poor laboratory examination of the specimens obtained.

As would be expected, more carriers have been discovered in New York State by means of epidemiological investigation in small communities than in large cities. Two-thirds, or 194 of the 288 carriers so discovered in the state, outside of New York City and state institutions, up to the end of 1932 were found in villages of less than 2,500 population or in unincorporated territory.

Excluding all those in known epidemics, 1,354 typhoid cases were reported in New York State places with more than 2,500 population outside of New York City and state institutions from 1928 to 1932, inclusive. During the same period, 1,325 non-epidemic cases were reported in places of less than 2,500 population and unincorporated territory. Thirty-five carriers were discovered from 1928 to 1932 inclusive, in the investigation of non-epidemic cases in places of more than 2,500 population, and 65 carriers were discovered in places of less than 2,500 population and unincorporated territory by means of the investigation of cases not occurring in outbreaks. Thus, a carrier was discovered for every 20 sporadic cases in places of less than 2,500 population and unincorporated territory, whereas the ratio of non-epidemic cases to carriers epidemiologically discovered in places with more than 2,500 population was 39 to 1.

Since this control measure has been used in New York State, 88 typhoid carriers have been added to the register as a result of making the release of convalescent patients conditional upon the submission of negative fecal specimens. Records have been kept since January 1, 1930, showing the number of fecal specimens obtained from each case, and the results of each examination. Between January 1, 1930, and September 1, 1932, complete records for 1,599 cases were obtained. Of this group of patients, 191 died, and 43 absconded or left the state. Two or more fecal specimens were obtained at intervals of at least 5 days and 3 weeks or more after date of onset from all but 47 of the remaining patients. Thirty-three,

or 2.5 per cent, of these 1,318 individuals remained positive for typhoid bacilli and have been, or will be declared carriers, this proportion being almost identical with that for Massachusetts reported by Bigelow and Anderson (1933).

Methods for supervising typhoid carriers, and the results of gall bladder operations for their cure have recently been described by Senftner and Coughlin (1933), and Bigelow and Anderson (1933). A few states and cities already have well developed facilities for handling the typhoid carrier problem; but looking toward the eradication of the disease there is great need for the extension of this service in all parts of the country. Granting that the administrative machinery for these purposes is of necessity cumbersome, the discovery and supervision of carriers are essential preventive measures, not to be neglected because of the difficulties incident to carrying them out.

INDIVIDUAL CASES AND CONTACTS

At the present time, some communities go through an entire year without a single typhoid case and, excluding epidemics, there are few cities and counties in which more than 75 or 100 cases are reported annually. Typhoid fever now belongs to the group of uncommon diseases, demanding confirmation of diagnosis, and active health department participation in the management of each individual case.

The dearth of typhoid cases in teaching hospitals has been mentioned on various occasions, and since clinicians in practice see cases rather seldom, other febrile conditions, notably tuberculosis and undulant fever, are not infrequently erroneously diagnosed typhoid fever. Of the 3,561 typhoid and paratyphoid cases reported in New York State, outside of New York City, from 1928 to 1932 inclusive, 114 were later removed from the register because of wrong diagnosis. This number takes into account only cases in which the clinician went so far as to commit himself definitely to the local health officer, there having been an unknown but probably considerable number of instances where the diagnosis was changed before a report card had been filled out.

The advantages to the typhoid patient of hospital care have long been realized. Certain data are now available suggesting that the hospitalization of cases is also of value as a means for preventing the occurrence of subsequent cases among household contacts.

According to New York State records for the years 1930 to 1932 inclusive, in families where the primary case was hospitalized, 85 subsequent typhoid cases occurred among the 1,221 household contacts who had not been immunized or had typhoid fever previously, the subsequent attack rate being 7.0 per cent. Of 1,035 contacts of similar status with respect to previous attacks and immunization, but who lived where the primary case remained at home, 110, or 10.6 per cent, were attacked. Thus, the incidence of subsequent cases was more than a third lower when the primary case was hospitalized than would have been expected if this patient had remained at home.

Further, considering individual patients and members of the same families, it is possible to show indirectly that the incidence of secondary cases is related to the environmental status of the household. Subsequent attack rates among familial contacts of typhoid patients in places of 10,000 and over, and in places of less than 10,000 population in New York State, exclusive of New York City, are presented in Table III, the incidence of secondary cases being shown for two periods, namely, during the first 14 days after the onset of the primary case, and 15 or more days after this. In the preparation of this table,

all cases and contacts in known epidemics have been omitted; cases and contacts in families where a known carrier existed prior to the date of onset of the initial case have also been omitted; contacts giving histories of typhoid vaccination or previous attacks of typhoid fever have been left out.

The subsequent attack rates in both periods were significantly higher in places with less than 10,000 population, than in places with more than 10,000 inhabitants. Some of the cases during the first 14 days may not have been secondary, but may have arisen from the same source as the primary case. However, few original sources would be expected 15 or more days after the primary case, so that most of the cases in the latter period were probably contracted as the result of familial exposure.

Household contacts in communities of 10,000 or more population were apparently exposed to less risk than contacts in smaller communities. This finding may be interpreted as being due to the fact that houses in places of 10,000 or more population are generally equipped with running water and indoor flush closets, conditions under which the observance of case prophylaxis would be much easier than in homes without such conveniences.

TYPHOID VACCINATION

Of the preventive measures which have been widely used, vaccination remains to be considered. There is no doubt as to the efficacy of this procedure as a method for protecting contacts and individuals apt to be unduly exposed by reason of occupation or travel, and its usefulness as an emergency measure in civil population groups has likewise been proved. For example, Mustard (1930) reported the occurrence in Rutherford Co., Tenn., of 29 secondary typhoid cases among 695 non-immunized household contacts, but observed no secondary cases among 776 household contacts who had been immunized 1 month or more prior to exposure.

Although of demonstrable worth under special and emergency conditions,

TABLE III

SUBSEQUENT ATTACK RATES FROM TYPHOID FEVER AMONG CONTACTS IN FAMILIES WHERE THE PRIMARY CASE REMAINED AT HOME, ACCORDING TO LOCALITY AND DATE OF ONSET OF PRIMARY CASE, NEW YORK STATE, 1930–1932, INCLUSIVE *

Size of Locality	Days after onset of primary case				Subsequent attack rates per cent	
	1–14		15 and over		Days after onset of primary case	
	Number exposed	Number of subsequent cases	Number exposed	Number of subsequent cases	1–14	15 and over
10,000 and over	290	8	282	4	2.8	1.4
Under 10,000 and unincorporated territory	557	41	516	29	7.4	5.6
Total	847	49	798	33	5.8	4.1

* Exclusive of New York City and State Institutions, and exclusive of cases and contacts in known epidemics; contacts with histories of vaccination and previous attacks; cases and contacts in families with known carriers.

there are valid objections to the vaccination of civil population groups as a permanent, or semi-permanent control measure. In the first place, the argument used in advocating smallpox and diphtheria immunization as permanent measures to the effect that infection may be acquired from hidden sources even when there are no known cases in the community does not hold in typhoid fever. Unlike the other two diseases, sources of infection in typhoid fever are more or less stationary in character, and of such a nature they can eventually be eliminated.

The highest typhoid death rate observed during the period 1928 to 1932 inclusive, in any population group in the 11 states previously mentioned, was that for negroes in the rural sections of southern states, among whom deaths occurred at a rate of 13.4 per 100,000. At this expectancy, it would be necessary to immunize 7,400 people to prevent a single death, and about 740 people to prevent a single typhoid case. Taking into consideration the brief duration of the protection conferred by typhoid vaccine, the wisdom of spending time and money on a procedure which gives promise of such meager results may well be questioned.

SUMMARY

Typhoid fever has decreased in prevalence to a remarkable extent in all sections of the country, even during very recent years. Because of the low levels already reached, and since typhoid case and death rates are continuing to fall rapidly, eradication of the disease rather than control is the goal toward which future efforts should be directed.

Examining various preventive measures with the possibility of typhoid eradication in mind, it has been concluded that measures for the improvement of environmental sanitation are of major importance, and that these measures have not yet been used to the fullest possible extent.

Among the preventive measures which have come into greater prominence with the decline of the disease are procedures for the discovery and supervision of typhoid carriers. There is great need throughout all sections of this country and Canada for more intensive case investigation, and for the development of facilities for the supervision of carriers.

Typhoid fever now belongs to the group of rather uncommon diseases in which the diagnosis must be confirmed and the health officer must participate in the management of individual cases. It appears that other members of the household are less apt to contract typhoid fever when the primary case is removed to a hospital, and that when the patient remains at home fewer secondary cases occur in large than in small communities.

Under special and emergency conditions, typhoid vaccination is a useful and necessary procedure, but its employment as a permanent control measure in civil population groups is of doubtful value.

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Modern Trends in Public Health Administration in Cities*

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PRESENT trends in public health administration, in cities, are essentially the same as are those in counties and states. This is what one might expect, since some of the more important reasons for certain trends are the same throughout the country. I shall not attempt to mention changes that are occurring in many cities due primarily to the many various local conditions, but shall limit my discussion mostly to changes or trends that are more or less common to all cities.

It is generally acknowledged that business concerns should periodically take an inventory of their stock in order to plan intelligently for the future. During normal or prosperous times, it may be safe to drift along without worrying very much about one's present position or future destination, but during the storms of an economic depression, it behooves everyone to keep his eye on the compass and his hand on the helm.

What is true of business is also true of public health work. The time has arrived when even health officers must stop and ask: "Where are we heading?" The days of fairly adequate appropriations and sympathetic support for public health work are only pleasant memories in most communities. Many of the public health activities have been put in the class of nonessential public services in many cities, instead of being considered at least as vital to the welfare of a city as are fire and police protection and education. Reducing health department budgets even during normal times is a serious matter, but reducing them during years of poverty and distress, when both the need and the demand for public health services are tremendously increased, is something that even the most pessimistic health officer did not expect. The demand of tax payers for more and better public health service at a lower cost, has forced health officers to make many changes, regardless of the merits of such changes.

In considering, therefore, modern trends in public health administration, it must be remembered that many of such trends are apt to be only temporary, because they are due more to restricted budgets than to intelligent and efficient planning. There are some, however, that are not related to the present economic depression, and for that reason may be considered both permanent and desirable.

According to reports, which 20 city health officers were good enough to give me, some of the present trends in public health practice are as follows:

First, a more efficient and conscientious appraisal of all health activities and the elimination of the less essential services. One health officer expresses this trend as follows:

> The keynote of administration is to fight to the last ditch for the retention of essential

* Read before the Health Officers Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 9, 1933.

health services, and to permit the less essential things and all the frills to go by the board.

There appears to be no agreement as to what the less essential or so-called frills are. Most cities have reduced their appropriations for health bulletins, annual reports, and other health publications, but one health officer writes:

> It is very unfortunate that a great number of health departments have ceased to publish their bulletins and have curtailed their annual reports. This so-called depression has brought about economy which spells ruin for the proper steady development of health departments.

Fortunately, the inexpensive practice by health officers of making more use of the daily newspapers, the platform, and radio will at least to some extent make the curtailment of health department publications less serious.

Many cities have curtailed their school hygiene programs, by materially reducing the number of physical examinations of school children, but no one will contend that such examinations, even when hurriedly made, can be put in the class with frills. While it is true that some health services may appear nonessential when compared with other very vital health activities, nevertheless, when compared with road construction and reforestation programs, the development of public parks and playgrounds, the construction of water power and irrigation projects, and many other expensive public undertakings, they not only appear very valuable, but also ridiculously inexpensive. On the whole, health departments have had to fight too hard for increased appropriations, even during prosperous times, for them to have been even tempted to develop so-called frills. Almost every public health activity is considered unnecessary by the large tax payers who have all at once discovered that it is cheaper for them to purchase their preventive treatment from the private physician, than to be taxed for a community health program. Let us, therefore, be very careful in appraising our present health services, and not be influenced too much by selfish interests.

The second trend that seems to permeate nearly all city health departments is toward coördination and consolidation. Various divisions within health departments are being merged into larger units. It is becoming more common to consolidate the divisions of contagious disease, tuberculosis, and venereal disease into one bureau or department.

The trend from specialized public health nursing to generalized nursing is slowly continuing.

Better team work is being developed between public health departments and private health and social agencies.

Cities are depending more on general hospitals for the hospitalization of contagious disease cases.

The tendency to transfer services related to public health, but not necessarily requiring health department supervision, to other city departments, is on the increase. It is being realized more and more that activities related to public hygiene and sanitation can be supervised more economically and much more efficiently by the police, fire, public works, and housing departments, than by a few sanitary inspectors.

In many cities health departments have been compelled to assume responsibility for the treatment of the indigent sick. The demand for free medical care has become so great that it can no longer be met by the medical profession and small private dispensaries.

At least one health department is also offering free diagnostic service to private physicians for patients unable to pay the fees of specialists. There is a great need for this type of service and unless the medical profession offers better diagnostic service to the middle class people, the trend toward a public diagnostic service will grow.

Although the demand for economy has forced many mergers in health departments and communities, yet few, if any, mergers of several communities have occurred. Politicians still prefer expensive and inadequate public service to the danger of losing their jobs through the consolidation of several governmental units.

As a third trend, I might mention the increasing practice of health departments to center their attack on younger age groups. Diphtheria immunization work is gradually being limited to infants and preschool children.

In tuberculosis work health departments are no longer waiting for people, with a history or signs and symptoms of tuberculosis, to report to their chest clinics for an early diagnosis, but are developing intensive tuberculosis detection programs in schools. The tuberculin test and X-ray are no longer limited to a few children suspected of tuberculosis, but are made available in many cities to all children in the upper grades and high schools.

The last, and undoubtedly the most important trend in public health administrative practice, is the turning over to the medical profession of many old established health services. Most of these were established in health departments years ago by physicians in private practice. At that time it was felt by members of the medical profession that a preventive health program could only be successfully developed and operated by a public health agency.

For years, health departments with the coöperation of private physicians have gradually enlarged and improved their health activities. Very few physicians questioned either the authority or ability of health departments to conduct child welfare, tuberculosis, venereal disease, and immunization clinics, until recently.

Not only are private physicians demanding a greater opportunity to participate in preventive health work, but nearly all health officers are willing to turn over at least some of their work to private physicians. Whether this is only a temporary trend due to the economic depression, or a permanent change, is not easy to determine. I feel certain, however, that unless this change in public health practice is made in an orderly, unselfish, and intelligent manner, there is great danger that everyone concerned will sooner or later suffer from an inadequate and impractical public health program.

The following excerpts taken from letters of health officers, give perhaps a fair picture of the attitude prevailing among health officers on this problem:

1. The private physician should be given a more recognized place in the health of the community.

2. Find some means to overcome the antagonism of private physicians to the preventive work we are trying to do.

3. My views with respect to present trend generally in cities in public health work, are that while many of the activities undertaken by government agencies in various cities probably accomplish a good purpose and meet the approval of the citizens generally, I am wondering on the other hand, if many of these activities do not legitimately belong to the private physician, and should they not be given proper consideration.

4. I realize that in some of the larger centers, the medical profession has interested itself considerably in the advancement of public health work. I cannot believe that this will become permanent, or that it will assume the responsibility of carrying on public health work. A few of them, undoubtedly, would show sufficient interest and take the responsibility, but not the rank and file.

5. After many years of public health work, I still feel that the sum of the efforts of the individual physicians is the greatest asset in the whole game of public health. Any health officer who has not the full confidence of the medical profession is a failure and his work is a failure.

6. I should like to feel that the trend is toward preventive medicine among both the medical profession and the laity, but I am

afraid this would be limited to a comparatively small group.

7. We are continually dodging thrusts from various organizations, even sometimes from our own profession, and we have got to work out some problems of our own organization in order to make ourselves secure.

8. Now as to tendencies for the future no one can prognosticate with certainty. My own impression, formed from personal observation of what is going on around me, and from reading about what is transpiring in other provinces of the Dominion as well as in the United States, is that we are gradually coming to State Medicine, whether we like the prospect or the reverse. Legislation in the Western Provinces providing for the appointment of government paid district physicians and the increasing army of private physicians, earning barely a decent subsistence, that in increasing numbers are openly advocating State Medicine as a solution for present difficulties, would indicate a trend in its favor on the part of both the profession and the laity.

The adoption by states and provinces of the responsibility for providing an adequate medical service for the vast population comprising what might be called the near indigent, presupposes changes and adjustments in our public health services, local, state, and federal, which it would be entirely impossible to predict. Moreover, in my opinion, it can be reasonably contended that hospital administration in many of its aspects is and should be intimately related to the public health program of the community, and the same is true in regard to the administration of poor relief.

Briefly expressed, it is my firm opinion that we are approaching a new era—a new conception of values in the field of preventive medicine—and that if we are to justify our work in the future new relationships and adjustments in the fields of prevention, therapeutics, social service, hospital administration, voluntary assistance, etc. will eventually be adopted.

We see from these excerpts that even health officers do not agree among themselves as to certain trends and their merits. It appears that the time has arrived when a public health program should be developed to which not only all health officers can conscientiously subscribe, but which will also be approved by the medical profession.

Representatives of the American Public Health Association ought to meet the representatives of the American Medical Association, to see if it is not possible to standardize a public health program, satisfactory to both organizations, without in any way jeopardizing the health and welfare of the public.

While someone has said that variety is the spice of life, we do not want to make radical changes in public health practice merely to be changing. During economic depressions when people are compelled to give up many things which they have previously enjoyed, we find irresistible demands for all kinds of changes. Many of the demands are spontaneous, justifiable, and for the benefit of society, while others are forced by a selfish minority, are unreasonable, and are very apt to be detrimental to a majority of the people.

The philosophy that when things are very bad they cannot be made worse by any kind of a change, has been responsible for much grief and regret in the past, and should therefore be applied very cautiously in the future. It may be safe to change our local, state, or national administration during a period of economic depression and unrest; it may even be safe to change our constitution and long established governmental policies; in fact, it is not only safe to make changes in our political, economic, financial, and social life, but such changes are absolutely necessary, if civilization is to continue. The changes we must guard against are those that would have us give up something that has proved its value over a period of years, for something that is still in the experimental stage. Public health work, as practised during the last two decades, has stood the severe test of a 4-year economic depression, which should make all of us hesitate to accept radical changes without conscientious, fearless, and intelligent consideration.

The Depression and Its Effect on the Mental Health of the Child*

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THERE is probably no other single factor, unless it be the innate constitutional make-up of the child, which is so important in determining personality traits and life attitudes as the familial relationships in which the individual finds himself. The significance of such relationships is not to be understood primarily in terms of blood relationship or kinship but must be found in the personal interactions of the different members comprising the family. It quite naturally follows, therefore, that in any discussion of the depression in relation to mental health of the child we cannot ignore the effect of the depression on all the members of the family and, by extension of these effects since no family lives solely unto itself, on all others with whom the child comes into close contact such as teachers and playmates.

It is unfortunately true that the effects cannot be measured statistically in a satisfactory manner. In fact, what follows in this paper is pretty much the impressions of the writer drawn chiefly from his rather intimate contact with social agencies and as the direct result of his work in the Cleveland Child Guidance Clinic. Quotations from the writings of others will be cited only to substantiate the writer's own impression.

Let us cite what in the records of family and relief agencies is a very common story. Every psychiatrist in child guidance work is all too familiar with it. It will serve as a bird's-eye sketch of what is to follow.

In the early days of the depression Mr. A.; a sub-executive, like many other Americans in high and low places, did not take the situation so seriously. The attitude then expressed was that it could not last long, good times were just around the corner. As the months wore on and spring came without bringing improvement this seeming indifference was put aside. Husband and wife were plainly worried. The man was tramping the streets from morning till night but without success—a job could not be found. Mrs. A., however, could not understand the situation. She felt the husband was not really looking for work. Then began the family quarreling. The children quite naturally took sides—the boys were apt to side with mother, the girls, always close to their father, thought mother unfair to him.

Retrenchment had been made all winter. By spring, the savings were well-nigh exhausted. Standards of living were being lowered. It became necessary to give up their home and move into cheaper quarters in another

* Read before the Child Hygiene Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 11, 1933.

section of the city. The children were transferred from private school to public school. Their little world came toppling down about them and there was nobody to help interpret it to them. For them it spelled disaster. Their lives had been lived on another level. The question is not whether that was the proper level but rather that on that level they had been reared. They lost their sense of security, their foothold.

As time went on, savings were exhausted and the family had to turn to the relief agency and to exist on its meager allowance. Self respect was dragged into the mud. Always accustomed to paying rent, they now found themselves in no position to do so. Gas, electricity, telephone, all those things that tend to make living comfortable, had to be done without. Kerosene lamps, small oil burners, or cheap coal stoves now became the sources of light and heat.

The children who were formerly well dressed now had to be thankful for the cast-off clothing of others. Is it any wonder that many of them rebelled and became disagreeable, disobedient, and ugly toward their parents, or developed symptoms of so-called nervousness as expressed in fears, super-sensitiveness, physical complaints without organic basis, or in anti-social activity such as stealing and truancy?

In the homes of the poor, always on the ragged edge, all this has not shown itself so startingly as in the homes of the just above marginal to comfortable group. Among these were the citizens who had struggled to get ahead. Many had begun to buy their own homes—to be sure, covered with heavy mortgages. Soon they saw their homes lost. Others of this group had savings either in so-called savings banks, in building and loan associations, or in commercial banks. One after another these institutions closed their doors. Then came the bank holiday and some of our mighty banking institutions are now being liquidated.

Is it any wonder that one finds child after child, especially among the adolescent group, completely disillusioned about home owning, saving money for that rainy day, or trust in the honesty of his fellow man, particularly those in high places?

And what is the effect on the child whose father is a suicide? Not all those who suicide are fathers of families, but a goodly number of the approximately 23,000 who in 1932 so ended their lives were. Many, too, are discouraged adolescents who have found life not worth living. And Frederick L. Hoffman,[1] statistician, states that the situation "imperatively demands drastic social interference if a much more substantial rise to higher figures is to be avoided."

In our own clinic as we compared the material of the last several years with similar material previous to the depression we were struck at once with the greater complexity of emotional involvement. Hardly any case referred in these depression years fails to show evidence of the effect of the depression. In many instances this is not so much in the nature of the production of the problems presented but rather in the attitudes of the parents toward them. A characteristic statement of parents is the following: "Oh, I know I should try to understand the boy, but with all my other worries . . ."—the outgrowth of the depression, such as loss of job, home, savings, or extreme readjustments in living conditions such as moving in with in-laws, or into poorer neighborhoods, etc.—"his behavior drives me frantic." Some parents are a bit more honest and admit that their own emotional troubles are the cause of the child's conflict. May I here cite in highly abstracted form a case history that illustrates dramatically the effect of the parental problems on the life of

the child and the child's reaction thereto. In passing, let me state that, except for detail of the specific set-up, this type of problem has been a relatively common one since the depression began.

Mr. and Mrs. R. have been married 10 years. They have one child, a girl of 8. Mrs. R.'s endocrine state is such that she has not conceived again. Mr. R. has until these years always earned a good salary. Mrs. R. has had about everything of material goods she wished for. She was extravagant always and she found it difficult to adjust herself to the changing status of her husband's income. The little girl was overprotected and somewhat spoiled by both parents, and particularly by the father to whom she was very close.

With the reduction in income it became essential that the husband and wife agree on expenditures. However, the wife continued her extravagance or rather now failed to manage the little there was to the satisfaction of her husband. Quarrels ensued, witnessed by the child, as usually is the case. She was torn between father and mother. The father began to stay out late, and the mother's suspicions in due course were verified—there was another woman who sympathized with him to whom the man had turned in his trouble. All of this was told the child.

The child became increasingly fearful. She feared her father would not be home when she returned from school. This fear became overmastering. She refused to go to school. She would wake up very early in the morning and begin to sob. Breakfast was eaten amid tears. Then she had to be taken to school, and as she got to the steps she would vomit what little breakfast she had eaten. She feared to enter the classroom unless the teacher was in the room. If the teacher left the room, the child was thrown into such an anxiety state that she could not remain in the room but would have to follow the teacher. Only as some semblance of harmony were reëstablished in this home did these symptoms let up.

Other children in somewhat similar situations may develop more severe physical symptoms than just vomiting, and are seen in dispensary or consultation rooms and treated for this, that, or the other physical condition, when in fact the physical complaints are but symptom formation brought about because of emotional conflict states.

Another common complaint in which the depression plays a prominent part is stealing. To be sure, children stole before the depression, yet basically stealing is a "get even" reaction, and therefore is one well suited through which the child can express his feelings of unfair treatment. Such stealing may be money from the home, or the holding out of change when sent to the corner grocery, or the more serious crime of holding-up or breaking into homes and stores.

Children who previously had their little allowances are apt now to pilfer small change in order to continue having ice cream cones or candy. In some instances unsatisfied hunger adds to the urge. In other instances material possessions have become overvaluated. The child had built his feeling of security upon such possessions and now, when that feeling of security and equality is badly shattered in all other respects, must enhance it through possessing things and under the circumstances that means stealing them.

Truancy in our experience is not so common an outgrowth of depression factors in young children as in older ones. In fact, we believe the truancy rate has declined to some extent among younger children of poor families because of the warmth of the school building and the food served there. Also the greater sympathetic understanding of school teachers has con-

tributed in our experience to a reduction of truancy. Among adolescents, however, certain truancy cases are the direct result of the depression. In the early years of the depression it was easier for the boy and girl of 16 to 18 years to get a job than for father or mother. Many a child seeing the sad financial plight chose to absent himself from school and seek to better the family fortune.

This brings us to a consideration of the effects on mental health of the child who not only truants from school but also absents himself from home. Many of the homeless boys, and girls too that one sees, left home because they either could not stand the constant nagging of relatives over their not having jobs when they themselves were perfectly aware none could be found, or they felt it best to get out so that there would be one less mouth to feed. Some few, very few, have had a fairly enjoyable time. They have seen the world and found it not so bad. The majority, however, seem to be having a miserable time of it. Most of them are disgruntled, weary, and footsore. Almost all of these are discouraged with life—they have found it bitter and without understanding. Dr. John Levy sums up well this problem of the homeless boy. He writes [2]:

> One final question remains: What is going to happen to these fellows in the future? And this question is not nobody's business. As present economic conditions, as depressions repeat themselves, as these young men get older, reflect more and more frequently on the raw deal life seems to have given them, as they begin to read into the intangible causes of their downfall more specific motivation, as subsequent common working difficulties wipe out the heterogeneity of their background, as resistances are stirred up by authoritative opposition, stolid egocentricity will give way to more serious personality twists, more one-sided points of view, tensions, restlessness and need for motor outlets. From such social dynamics groups of psychopathic personalities are created. I wonder if revolutionists are not generated by the same dynamics. I wonder if these same causes do not make revolutions possible.

And what about the homeless adolescent girls? To what extent are prostitutes truly recruited from their number? In Cleveland, and no doubt it is not an exception, each year of the depression has seen a greater number of girls picked up because of street soliciting. "The (police) department records also show that the girls arrested on vice charges today are much younger than they were in former years. The conclusion is that even youth has not been an influence in getting jobs in the past years." [3]

I have purposely avoided discussing the effect of malnutrition on the mental health of the child. With that phase all public health officials are fairly familiar although one could question to what extent the mental implications of malnutrition are understood. Cuts in school examination budgets, physical and psychological, will unquestionably lead to neglect in the correction of remediable defects and the proper placing of children in classes where they can achieve satisfaction. Out of such neglect divers kinds of problems arise — day-dreaming, inattentiveness, stubbornness when corrected for something the child is not able to control, bullying on the playground as a get-even reaction, truancy, etc. Attention, too, should be called to such economic measures as the elimination or sharp curtailment of shop courses of one kind or another, music, art, etc. Not only is this limiting the educational opportunities of all children but such elimination makes impossible the proper adjustment scholastically of many retarded children who find the three R's as taught beyond their ability to comprehend. Many a child will therefore be forced to serve time, all the while building up unhealthy emotional attitudes toward at least this phase of his life situation.

The best study of the effects of the depression on the mental health that has come to the attention of the writer is *An Unemployed Village*, by Paul Lazarsfeld.[4] This study of the inhabitants of Marienthal, a village of Lower Austria, emphasizes " that parallel with the narrowing of the economic scope of these people, their psychic life has contracted." This psychic attitude the author defines as resignation, and he goes on to state, " this contraction of wants has a limit which cannot be exceeded. If it is reached, and if the external pressure continues to increase, the result is a catastrophic physical and psychic collapse." He finds that this holds true for children as well as adults.

In conclusion, permit me to state that, in my opinion, if ever there was a time for constructive work in the field of mental hygiene, now is that time. Only the unthinking can question the serious effects of these depression years on the mental health of both adults and children. In this field the morbidity rates have gravely increased.

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Free Medical Care for the Unemployed in Czechoslovakia

PROVISION of free medical care for the unemployed is to be organized and supervised, according to a recent ministerial decree, by a national council of government officials and representatives of trade unions and medical societies. The actual medical work will be done by local committees throughout the country. The unemployed and their families will be given, in case of illness, medical and hospital care and medicines and other articles necessary for the treatment of illness. The cost of the medical care will be borne by the Social Insurance Institute, the Ministry of Public Health and the druggists' organizations. The physicians will give their time free of charge.

This system of relief has no connection with social insurance.—*Deutsche Zeitschrift für Wohlfahrtspflege*, Berlin, Aug., 1933.

The Treatment of Trade Wastes*

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INDUSTRIAL developments, such as have taken place on a gigantic scale during the past two decades, are largely the products of applied research. Intensive study with ingenious application of scientific facts or findings on a practical and economical basis have been responsible for much of our progress, particularly in the phenomenal development of mass production in this country. The trend has been steadily to increase production, efficiency in the utilization of raw materials having often been sacrificed in the efforts to speed up the wheels of industry. In recent years, however, there has been a tendency on the part of manufacturing concerns to give such matters more attention and apply research to reducing their industrial wastes for economic reasons as well as to solve problems confronting them involving the abatement of atmospheric and stream pollution.

The public has become increasingly aware of the harmful effects of unrestricted stream pollution. The uses of natural waters for drinking and domestic purposes; for watering of stock; for industrial water supply; for propagation of fish, oysters, and other aquatic life; for navigation; for power production; for agricultural development involving irrigation; and for recreational purposes, including bathing, boating, and fishing, particularly for game fish—all these uses have been adversely affected in some degree by utilizing the same waters for the disposal of sewage and industrial wastes. Streams have been so grossly polluted in some cases as to render them absolutely unfit for normal uses. The result has been a growing demand that our natural waters be kept in a reasonably clean condition.

Public demand for clean streams in this country is evidenced by legislation enacted by many states and the federal government. The early laws tended to be absolutely prohibitory in nature, and were in a number of cases impractical of enforcement. Numerous damage suits arising from unrestricted pollution of streams, however, have been instituted, and the courts have in many instances upheld the rights of riparian owners under the common law to receive the waters flowing through their property "undiminished in quantity and unimpaired in quality."

Law enforcement alone does not provide the solution of many problems of pollution by industrial wastes. There are technical and economic, as well as legal, aspects to be considered. Accordingly the trend in recent years has been toward the establishment of governmental, industrial, and other agencies to undertake coöperative studies, to work out suitable means of reducing these wastes to a minimum, and to bring about the necessary stream improvement.

Industrial groups are becoming increasingly aware of the advantages of collective action in solving some of

* Read before a Joint Session of the Central States Sewage Works Association and the Public Health Engineering Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 12, 1933.

their common problems of waste utilization or disposal, as evidenced by the employment of engineers especially for this purpose by such organizations as the American Pulp and Paper Association and the American Petroleum Institute. There is already much evidence to show that the programs adopted by these various agencies are producing definite results and are materially beneficial in cleaning up the lakes and streams of the country.

The general policy underlying the various programs through which these results are being obtained calls for: (1) waste utilization to the greatest possible degree, and (2) if a pollution problem still exists, installation of any effective and practical method available or capable of being developed to treat and dispose of the waste in a satisfactory manner. With certain wastes, such as those produced in pulp and paper mills and in corn products plants, it has been found that by carrying waste utilization to its economic limits, pollution problems have been entirely eliminated or greatly minimized; and in these particular cases that the value of the substances recovered materially exceeds the cost of installation and operation of the recovery systems.

In order to illustrate the trend in procedures instituted to secure the solution of industrial waste pollution problems, the program being carried out by the Wisconsin State Board of Health may be cited. Activities relative to this program have for the most part been with the coöperation of the industries affected and in the main have included (a) the determination of the pollutional character of wastes from the state's larger industries, (b) research on and investigation of economically feasible ways and means of utilizing and of reducing the volume and strength of these wastes, and (c) educational and promotional measures to secure voluntarily indicated improvements. Steps taken in dealing with three of the major industrial wastes problems, are briefly outlined:

Pulp and Paper Mill Wastes—Waste utilization and stream improvement activities by the Wisconsin pulp and paper industry and state agencies were started in February, 1926, following a meeting with mill executives held in Milwaukee. At this meeting it was pointed out that the mill wastes constitute one of the principal sources of stream pollution, but that no practical and economical methods of recovering or treating some of these wastes had yet been developed. Accordingly it was decided to seek coöperatively a solution of the various problems presented. To this end the industry appointed a committee of 7 to work with state officials in inaugurating and carrying out a definite program.

As a first step in this program all mills were called upon to determine fiber losses and take prompt action to reduce them to a minimum. With equipment available it was considered possible to render fibrous wastes neglible from the pollution point of view.

All pulp and paper mills in the state have been visited at intervals, to ascertain what steps had been taken in reducing objectionable fibrous and chemical wastes to a minimum and to foster further activity. Studies to obtain data for determining the fiber content and the pollutional value of wastes from each mill and for evaluating improvements in mill equipment and operation have been carried out in 1926, 1929, 1931, and 1932. Results of these studies have been published.[1, 2, 3] In most of the mills efforts were being made to reduce white water wastes to a minimum through the installation of new "saveall" and recirculation systems. In some mills the fibrous wastes have been reduced to a practically negligible quantity.

This pulp and paper mill waste utilization and stream improvement program has been continuously carried on with the assistance of the committee on waste disposal of the Wisconsin pulp and paper industry. The effectiveness of chlorine-ammonia treatment for slime control in white water systems in pulp and paper mills has been further demonstrated during the past 2 years. Accordingly it is anticipated that more widespread use of information obtained will be effected during the coming year in establishing recirculation or closed systems for the white water, further reducing pollution by fibrous material.

It is further understood that progress has been made in the development of recovery processes for chemical wastes, such as produced in sulphate and sulphite pulp mills. Methods have been established for the re-use of lime sludge, which is produced in the operation of sulphate pulp mills, or its disposal as agricultural lime. Sulphite waste liquor utilization experiments are being conducted. One mill, which has been conducting pilot plant tests of the Howard Fractional Precipitation Process has reported: (1) that the process is commercially feasible to install and operate; (2) the values under Wisconsin conditions of the recovered products for making fresh cooking acid and for a boiler fuel will carry the process and show some net profit; (3) that the tail-liquor effluent from the process has much less oxygen demand than the untreated liquors and probably less toxicity to fish life. The next step will undoubtedly be a commercial scale demonstration of this process.

Studies were conducted to determine just how wastes from pulp and paper mills may interfere with the use of a stream for the propagation of fish. It is fairly well known that fish may be affected by pollution in any or all of the following ways: (1) direct killing through toxic constituents; (2) changes in natural conditions, such as depletion of dissolved oxygen, so that fish seek another habitat either because of the condition of the water or the effect the wastes have on plants or lower animal life constituting their food; and (3) interference with the development of fish life and young fish, that is, influence on the reproduction of the species.

In comparing sulphite and sulphate pulp-mill waste liquors it was found that a direct toxic effect on the game fish used in the experiments might be expected when the wastes were diluted less than 1 part in 200 by volume. The wastes did not differ greatly with respect to the degree of dilution required to avoid destruction of fish by their poisonous constituents, presumably mercaptans or sulphur compounds. However, the sulphite wastes had a much greater avidity for oxygen than the sulphate wastes. Since these sulphite and sulphate wastes would probably deplete the dissolved oxygen in a stream below the critical amount necessary to sustain fish life before the limiting dilution of 1 part in 200 for toxic effects was actually reached, the most significant basis of comparison is their oxygen demand. Their relative effect on fish foods or reproduction of the species cannot be readily measured with our present knowledge.

If these wastes were compared according to their suspended solids or pulp fiber content, there would be practically no difference between them. Tests indicate that pulp fiber does not ordinarily accumulate in, and clog the gills of, fish causing death by suffocation. There is, however, the possibility of an indirect effect if fibers and other solids settle to the bed of a stream and decompose there, using up the dissolved oxygen necessary to support fish and other aquatic life.

Milk Plant Wastes—During the period 1927–1930 experimental work was conducted with 5 methods of treat-

FIGURE I—Trickling filter for the treatment of milk plant wastes

ment for both creamery and condensery wastes at DeForest, Wis. Preliminary results were published during 1929.[4] Further studies and observations along with results obtained in Iowa, Ohio, Michigan, and elsewhere, having shown the feasibility of efficient and economical treatment of milk plant wastes by direct discharge on crushed rock filters, 10 full scale treatment systems of this nature have been designed and installed in Wisconsin since 1930.

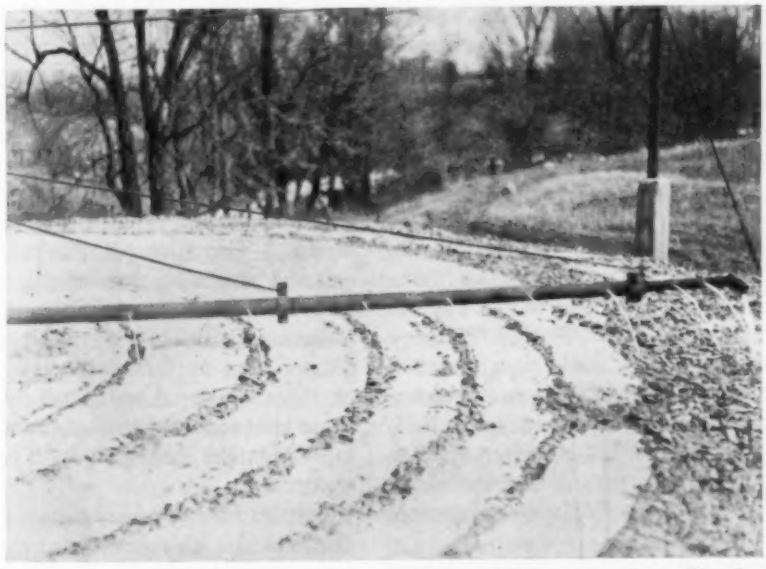

FIGURE II—Rotary distributor used in dosing a trickling filter for milk plant wastes—under winter operating conditions

FIGURE III—Bleeder at the center of the rotary distributor of a milk waste filter to prevent freezing difficulties during winter operation

Further progress has been made during the past year in developing ways and means for effective treatment and inoffensive disposal of milk plant wastes. Trickling filter installations made during the preceding 2 years, based primarily upon the previously reported experimental work at DeForest, utilized tip-troughs for periodic discharge of the wastes over the filter surfaces. Slime accumulations on the distribution boards resulted in uneven dosage of the larger filter units. Accordingly two large milk waste treatment plants installed during 1932 were equipped with rotating distributors for the filters and, in one case, an automatic timing device for regulating the filter dosing cycle. Operating efficiency studies have been made at all of the milk waste filter installations completed to date. Results obtained have indicated that these trickling filter systems accomplish very effective removal or modification of pollutional substances in the milk wastes.

Cannery Wastes—In October, 1925, cannery wastes were discussed before the Convention of the Wisconsin Canners' Association at Milwaukee, and difficulties encountered in disposing of pea cannery wastes were outlined. It was pointed out that no satisfactory method of treating such waste had yet been developed, and that, while this was the problem of the industry, the state would coöperate in reducing objectionable stream pollution. A definite appropriation of $500 by the industry was made to start experimental work during the following summer, in order to develop, if possible, practical and economical means of treating these wastes. The appropriation was made, and the results of this investigation are included in Part III of the report, *Stream Pollution in Wisconsin*. This work indicated that approximately 75 per cent of the pollutional value of the wastes could be removed by chemical treatment, on the basis of 5 day B.O.D. results.

On the basis of information obtained during 1926, chemical treatment plants have been installed and operated at Wisconsin canneries where pollution

FIGURE IV—Rotary screen unit for removal of large solids from cannery wastes. Wastes are collected in the screen sump and pumped to the chemical treatment plant or to areas utilized for disposal by soil absorption

problems existed. Thirty-three treatment plants of the chemical precipitation type were available for treatment of cannery wastes in Wisconsin during 1933. In addition, most of the canneries have provided preliminary treatment for their factory wastes by screening, and some are using ground absorption for final disposal where soil conditions are favorable. Studies conducted of the treatment of wastes produced in the canning of beets indicated that by the application of 14 lb. of lime and 4½ lb. of ferrous sulphate per 1,000 gal. of the composited washer, pealer, blancher, capper and other wastes incident to the beet canning process, a reduction of 96 per cent in suspended solids, and 50 per cent in 5 day B.O.D. can be effected in a fill and draw type chemical precipitation plant. In the treatment of carrot canning wastes the use of 7¼ lb. of lime and 3¼ lb. of ferrous sulphate per 1,000 gal. of wastes effected a reduction of 98 per cent in suspended solids, and 67 per cent in 5 day B.O.D. using the fill and draw process with a 2 hours settling period for the treated wastes.

In view of limited dilution available at the cannery where these studies were conducted the wastes were pumped into the dosing tank of a trickling filter at the municipal sewage treatment works. The effluent from the plant showed 82 p.p.m. total solids, 57 p.p.m. suspended solids, and 88 p.p.m. 5 day B.O.D. during the period these cannery and other wastes were being applied, entirely satisfactory for final disposal in the small stream available for dilution of the wastes.

A cannery company packing kraut located near the headwaters of a small stream flowing through a dairy region was confronted with a problem of so disposing or treating their wastes as to prevent a nuisance and "kraut" tastes in milk furnished by the cattle using the stream as a source of water supply. Lagooning or disposal of the wastes by soil absorption was impractical because

FIGURE V—Chemical treatment plant of the fill and draw type used for the treatment of cannery wastes

(a) Sump
(b) Float control for pump
(c) Pump pit
(d) Chemical treatment tank
(e) Chemical storage house
(f) Sludge drying beds

of the character of the soil and other local conditions. Studies were conducted and a treatment system was installed, including removal of gross solids by a 40 mesh rotary screen, chemical precipitation using alum and lime in fill and draw tanks, sand filtration using filters equipped for backwashing, and chlorination for the filter effluent. The treatment process has been successful in overcoming the objectionable conditions previously experienced.

Much of the activity outlined and improvements effected have been the result of coöperative effort. Research conducted by industry, state, and other agencies has pointed the way toward the solution of these waste utilization and stream improvement problems. When the effectiveness of a waste treatment or recovery process has been definitely demonstrated, and particularly when it can be shown that some financial return will be realized in connection with such process, much objection on the part of industry to expenditures for improvements is overcome. A wide diversity of trade waste problems exists in this country, but it is believed that the common approach to their proper solution lies in mutual understanding and coöperation.

In conclusion, it is urged that the coöperative policies and procedures be extended and further developed by government, industry, and others concerned to the end that the most effective and economical solutions for industrial waste problems may be most speedily and satisfactorily accomplished.

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Why Not Save Hospital Beds?*

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FOR years Dr. Dublin of the Metropolitan Life Insurance Company has been urging visiting nurse organizations to place greater emphasis on the care of communicable disease in the home, even if it became necessary to reduce the maternity programs, which he considered unduly large. While we still believe the emphasis on maternity care is justifiable because of the opportunity for health teaching, recently our attention has become more definitely focused on communicable disease control by some studies made in New York City.

In 1931 a survey of the communicable disease hospital needs in one of the large boroughs of New York City was made under the guidance of a committee appointed by the State Charities Aid and working in coöperation with the Department of Hospitals and the Department of Health. Up to that time apparently no one had considered the relationship between a visiting nurse service caseload and the communicable disease hospital needs of a given community. In fact, some of the members of the committee saw no reason why the visiting nurse records should be included in this study. However, the director of the study, Anna Phillips, herself a public health nurse, insisted, and the significance of the visiting nurse figures is apparent in her report. As one member of the committee expressed it, "When I saw those figures showing that the Visiting Nurse Service had given care to more patients in the home than were sent to hospitals I went straight to the Commissioner." To his surprise the Commissioner replied, that, of course, the Visiting Nurse Service had cared for communicable disease patients in their homes for many years.

This survey raised a number of questions in regard to the Visiting Nurse Service. First, was it true that the Visiting Nurse caseload was limited to milder cases? Second, was it true that a great many secondary cases developed when patients were kept at home? Third, did the Visiting Nurse Service send its sickest patients to a hospital and then omit the hospital deaths in its final fatality rate?

To answer these questions we made an analysis of our own records for 1932. As it was not possible to make a control study of hospital cases at this time, it was decided to use the same area (the borough of the Bronx) and the same 4 communicable diseases (diphtheria, scarlet fever, whooping cough, measles) as in the Phillips survey of 1931. This study showed that 12.4 per cent of the patients had complications before admission to the hospital; 16.6 per cent developed complications after admission —a total of 29 per cent of hospital cases with complications.

The study of visiting nurse records for one district (315 cases) showed 26 per cent of the cases had one complication, and that a total of 35 per cent had one or more complications. It is not possible to make a comparison between the hospital and Visiting Nurse

* Read before the Public Health Nursing Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 10, 1933.

Service figures, since the present records of the Visiting Nurse Service do not indicate whether a complication arises before or after admission to the service; and it was also learned after the study was made, that the hospital total did not include some of the minor complications which were used in the visiting nurse study which was based on the classification of Willard Parker Hospital. Furthermore, as Miss Phillips points out in her report, no conclusions can be drawn from such a statistical study as there is no way of determining the previous condition of the patient, his susceptibility to disease, and so forth. The study did indicate, however, that the Visiting Nurse Service caseload is not limited entirely to the milder cases.

In the study of secondary cases it was decided to omit whooping cough and measles, as these are so often diagnosed too late to prevent secondary infection, and also diphtheria, as the number of cases was too small to be of interest.

It is significant that in the 309 families where scarlet fever occurred there were 124 families with younger children where no secondary cases developed. In the 38 families where there were 2 or more cases of scarlet fever there were only 19 patients where the onset of disease developed after the 7th day from the first visit of the nurse; a total of 5.4 per cent of the entire number of patients with a secondary case which developed after the 7th day.

With this low rate of secondary cases is it not reasonable to assume that risk of secondary cases (considering the low fatality rate) is less than the risk of cross-infection in overcrowded hospital wards?

Dr. Charles Hendee Smith, for many years director of the Children's Service in Bellevue Hospital, New York City, recently stated in a radio address that the best place for a sick child is in the home, with 4 exceptions: for major operations; where special treatment such as transfusions are needed; where special equipment is needed for difficult diagnosis; or where home conditions are impossible. In the care of communicable disease, it seems to me that the question of home conditions is of primary importance. Dr. Best, Chief of the Bureau of Communicable Disease, recently requested that when our nurses ask for a diagnostician in undiagnosed cases where the family is unable to pay for a private physician, the nurse also indicate whether hospitalization seems advisable, thus showing the importance of the nurses' judgment on the home situation.

Of the 19 families where secondary cases developed after the 7th day, only 1 case was considered by the nurse as entirely satisfactory for home care.

During 1932 all cases of scarlet fever, measles, whooping cough, and diphtheria that were sent to hospitals after being seen by the Visiting Nurse Service, were followed up, and the deaths which occurred in hospitals were included in the total deaths for the year. In the 2,648 cases seen by the visiting nurses in the three boroughs of New York City served by the Henry Street Visiting Nurse Service, the deaths amounted to 16. Of these, 9 died in the hospital; 7 of these cases should be considered as "not nursed" cases since the nurse either made only 1 or 2 visits to urge hospitalization, or no nursing care was given as the physician in charge did not think it necessary. Nevertheless, the 16 deaths are included in our case fatality rate for the year. In 8 cases it was the nurse who first suggested and urged medical care or calling an ambulance.

In the 956 cases of scarlet fever death occurred in 2.

We appreciate the fact that further study is needed since up to the present Henry Street is the only nursing or-

TABLE I

SCARLET FEVER, 1932

Four Cities Over 1,000,000	*Total Reported Cases*	*Total Deaths*	*Case Fatality Per Cent*	*Death Rate per 100,000*	*Per Cent Hospitalized*	*Per Cent Served by V.N.S.*
New York City	21,093	134	.63	1.86	25.8	
3 Boroughs Served by V.N.S.	11,726	76	.64	1.73	28.5	8.1
Philadelphia	6,549	48	.70	2.46	67.0	3.0
Detroit	6,549	41	.60	2.74	47.0	7.5
Chicago	7,637	137	1.80	3.90	41.0	—

ganization which has followed up its hospital cases and included these in its final death rate. However, with the figures available from other cities we believe we have some facts which should set us thinking.

When preparations for this paper were begun it was taken for granted that the question of the safety of the care of communicable disease in the home in a generalized visiting nurse program had been settled at the Annual Meeting of the Association in 1925. At that time a forum was held on the question "Is the Public Health Nurse a Carrier of Infection?" Previous to the meeting, questionnaires had been sent to visiting nurse directors and health officers from coast to coast. From the replies received it was apparent that there was no *recorded* instance of a nurse carrying disease from patient to patient, and that many health officers were convinced that it was safe to carry on such a program. Furthermore, from the discussion which followed at the meeting many of us went away with the feeling that the safety of including this service in a generalized program was an established fact. However, in 1933, it was found that in the 10 largest cities in the country there were only 5 visiting nurse organizations which were knowingly giving care to communicable disease patients.

In the tables the study has again been confined to scarlet fever. As Miss Phillips pointed out, scarlet fever is considered a major cause of seasonal overcrowding in hospitals. Her report showed that the average stay of a scarlet fever case in a New York hospital was 26 days. The hospital cost which she quotes for one hospital was $8.86 per day in 1930, or an average of $234 per case. The care of scarlet fever cases is then an important factor in city budgets.

Table I shows the 4 cities of over one million population. Here it is interesting to note that 3 cities have practically the same case fatality rate, and in all of these the Visiting Nurse Organization is permitted to give care to communicable disease patients.

One wonders, if a city can maintain

TABLE II

SCARLET FEVER, CHICAGO—FIVE YEARS

Year	*Cases*	*Deaths*	*Case Fatality Per Cent*	*Death Rates*	*Per Cent Hospitalized*
1928	4,335	78	1.8	2.40	34.4
1929	7,945	168	2.1	5.07	34.2
1930	9,599	199	2.1	5.89	32.1
1931	8,209	177	2.2	5.13	35.4
1932	7,637	137	1.8	3.90	41.2

a case fatality rate by hospitalizing 25 per cent of its cases, as low as that of a city hospitalizing 67 per cent, why there should be an increasing emphasis on hospitalization? The families do not want to send their children to hospitals—the children do not want to go, and certainly the tax payers are full of protests against unnecessary costs.

Since New York and Chicago represent opposite points of view in regard to home care, we have made a study of hospitalization and death rate for the past 5 years, which is interesting. Chicago does not allow the nursing service to give care to communicable disease patients, and maintains a high rate of hospitalization. Its case fatality per cent and its death rate, however, do not indicate for a 5-year period that great gain has been made by hospitalization.

TABLE III

SCARLET FEVER, NEW YORK CITY—FIVE YEARS

Year	*Cases (Five Boroughs)*	*Deaths*	*Case Fatality Per Cent*	*Death Rate per 100,000*	*Per Cent Hospitalized*
1928	10,586	69	.65	1.08	15.9
1929	7,952	68	.85	.99	18.8
1930	7,592	57	.75	.82	20.0
1931	11,900	84	.70	1.18	21.9
1932	21,093	134	.63	1.86	25.8
Five Year Average					
	New York City		.69	1.18	21.5
	Chicago		2.01	4.46	35.3

In New York City it will be noted that the death rate and case fatality per cent remain approximately the same throughout the 5-year period, and its per cent of hospitalization is much lower than Chicago. Here the Visiting Nurse Service is permitted to give care to communicable disease patients in the home.

A close-up picture of the average for the 5-year period is given in this chart for Chicago and New York City. The question naturally arises as to whether Chicago's emphasis on hospitalization is because of unusually bad home conditions—but Chicago was able to achieve the most favorable infant death rate of any large city for 1932.

Table IV gives a picture of the increasing caseload of the Visiting Nurse Service for the past 5 years, the actual number of cases having trebled, and the percentage of total reported cases showing a great increase. Since we had not definitely made a follow-up study of hospital cases previous to 1932, it seemed advisable to give the percentage of hospitalization of cases seen by the visiting nurses. It will be noted that during the last 2 years 10 per cent of these cases were sent to hospitals, but neither of the 2 deaths in 1932 occurred in the hospital, and the records indicate that in 1 case the nurse made every effort to have the patient hospitalized but was overruled by the family and physician.

It seems particularly interesting that there are no deaths in the cases referred to hospitals by the visiting nurses. A study should be made of the relative time which elapses between the date of onset and date of admission to hospital on cases seen by the Visiting Nurse Service and those who have no such nursing supervision. The main object of this paper is to stimulate further study on this phase of public health work.

The public needs more facts on this question of home care. At Henry

TABLE IV

SCARLET FEVER IN NEW YORK
CARED FOR BY THE VISITING NURSE SERVICE IN FIVE YEARS

Year	*Total Reported Cases*	*Cases Served by V.N.S.*	*Per Cent of All Reported Cases Served by V.N.S.*	*Number of Deaths V.N.S.*	*Per Cent Cases Served by V.N.S. Subsequently Hospitalized*
1928	5,002	336	6.1	0	5.0
1929	3,257	226	6.9	1	6.1
1930	3,180	234	7.3	0	9.8
1931	8,506	621	7.3	1 (hosp.)	10.6
1932	11,726	956	8.7	2 (home)	10.5

Street we have developed communicable disease technics which have been approved by our Medical Advisory Committee and accepted by the Health Department, and no protests have come from the community served. This is interesting in view of the comment of the director of a visiting nurse organization which is not permitted to include the care of communicable disease in its generalized program. She writes: "Of course you and I know it is perfectly safe, but until the public knows it and believes it, it will not be done with the approval of the public."

In conclusion, there is one further point which I wish to emphasize. It is obvious that when a patient is sent to the hospital very little education in the principles of communicable disease control can be done in the family. In his article "Facts, Fallacies and Assumptions Concerning Communicable Disease Control,"[1] Dr. Carl E. Buck maintains that "the prevention and control of communicable disease is primarily the responsibility of the individual and the indivdual family. The educational efforts of the public health nurse constitute the most important factor in the development of this sense of responsibility in the individual."

Can there be any further doubt, then, in these days of measuring budgets and values of service, that this safe and economical way of providing care in the homes of communicable disease patients is of the utmost importance in a visiting nurse program? And finally, is it too much to hope that health officers will soon universally agree that the visiting nurse is a valuable aid in the control of communicable disease?

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DISCUSSION *

LOUISE KUCK TOOKER, R.N.
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A TRUE public health nurse, with eyes open to every opportunity of service, carries on a constant battle against communicable disease whether that function is listed among her agency's activities or not. Working in homes, clinics, and schools, she does not wait until the community is faced with a communicable disease epidemic before she starts to teach age old habits of cleanliness and decency wherever she can.

Very definitely the public health

* Abstract.

nurse can insist upon keeping children away from sick people as the tuberculosis nurse has learned to do on her first visit to a family. This isolation is no less important in some other illnesses. It is equally important to keep the sick child away from other children, especially if he is classified as "not very sick" or "just getting a little cold." For, after all, does not the patient do most damage in the way of infecting others before he is sick enough to go to bed?

The public health nurse working in the school has a fine chance to enlist the coöperation of parents and principals in keeping children with colds at home for a few days. In one of the Cincinnati suburban schools a committee from the P.T.A. assists in notifying parents that children are being sent home, and, if necessary, conducts little ones home. They have arranged cross files of friends with whom a child may stay if the mother is away.

Who better than the public health nurse can bring about early diagnosis and reporting of cases? Even some of the wisest mothers say to the nurse "I just thought I'd ask you; I hate to call in the doctor for every little thing." Yet seldom does a mother delay calling the doctor after the nurse points out the importance of doing so.

PASADENA

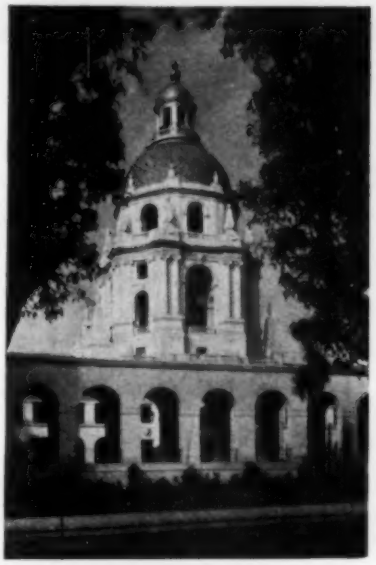
A.P.H.A. Convention City for 1934

AS Pasadena has been honored by the A.P.H.A. in being selected as a meeting place for their convention in 1934, the city extends a most cordial message at this time to all who are planning to visit with us. It is that you will come as honored guests and for the length of your stay find happiness with us and carry away when you depart a bit of that glow about your hearts that your coming has given to us.

When Don Caspar de Portola and his band of explorers passed north in 1770, through the region now known as Southern California, they camped for a night near an Indian village in the foothills, overlooking a fertile valley. In the morning they awoke to view a spectacle of mountains and flowering valleys that brought forth exclamations of amazement and delight.

One hundred and four years later a group of sturdy pioneers from Indiana searching for a place to replant American homes and ideals that would bring happiness and security to their children selected that same spot which had delighted Portola and his followers. In 1875 this settlement, known as the Indiana Colony, formally adopted the name "Pasadena." It is a word derived from the Chippewa Indian dialect, meaning "Crown of the Valley." Since these early days many thousands from all parts of the globe have found here an ideal spot in which to live or spend a vacation.

The climate permits flowers to bloom and grass to be green the year around. Summer or winter, the days are delightful and the nights are cool. Weather Bureau statistics for 50 years show that January has an average temperature of 55, July of 71, a variation of 16 degrees. The average year has twelve days when the thermometer registers above 90, and thirteen days when it goes below 40.



City Hall

Within the city are many beautiful buildings and homes divided by streets lined with trees unsurpassed in nature's grandest contribution to her loveliness.

On the north are lofty mountains whose beauteous spots are easily accessible by well paved roads open summer and winter for those who love the mystifying grandeur of mountain surroundings.

To the west is a great natural gorge, the Arroyo Seco, its bed beautified with parks and its sides dotted with tile roofed villas.

To the south and east is California's great citrus domain.

Eleven miles away is the downtown

The Rose Bowl

center of the largest city in western America, the motion picture capital of the world.

There are a score or more of seaside resorts within 2 hours of Pasadena by interurban or motor car. Within 4 hours' drive to the south lies Mexico, and within nearly the same time north the giant redwood trees, the many lakes, and other grandeurs of the High Sierras.

California Institute of Technology is in the front rank of American institutions devoted to technical education and research. Here are gathered professors of international repute in buildings and laboratories equipped with the latest instruments for scientific research. Approximately 500 students are enrolled from all parts of the world. Here is an institution worthy of one's visit, regardless of whether or not he is scientifically inclined. The famous Guggenheim Aeoronautical Experimental Station is located at the Institute.

Huntington Library—Ranking among the world's greatest museums, the Huntington Library comprises about 200,000 rare books and upward of 1,250,000 original manuscripts. The Huntington Art Gallery contains the greatest collection of English portraits ever gathered under one roof. The collection is made up of 45 paintings—41 portraits and 4 landscapes—all outstanding works from the brushes of masters. The most famous painting in the gallery is Gainsborough's "Blue Boy," bought from the Duke of Westminster in 1921.

Mt. Wilson—On the summit of mile-high Mt. Wilson is situated the Mt. Wilson Observatory of the Carnegie Institution of Washington, D. C.—regarded as the world's foremost center of astronomical research. Equipment includes the world's largest telescope. The museum with its exhibit of astronomical photographs is open to the public for an hour each afternoon. Aside from the observatory, the summit affords an inspiring view of the San Gabriel Valley and the coast line beyond, and a delightful inn and dining room are on the summit. A very interesting astronomical lecture is given every Friday night.

Busch Gardens—A short distance south of the bridge are the famous Busch Gardens. The gardens are situated on the estate of the late Adolphus Busch, but are open to the public.

Colorado Street Bridge

Comprising 30 acres of beautiful landscaping, novel garden effects and rare horticultural specimens, they constitute one of Southern California's most renowned scenic attractions. The gardens are built on the east slope of the arroyo, and the natural topography of the land has permitted landscaping achievements hardly possible anywhere else. In variety of floriculture and magnificence of landscaping, they are said to excel all others. Along the eastern bank of the arroyo, winding paths, now climbing, now descending, lure one through a veritable fairyland of flowers and shrubs and trees, thickly set with secluded resting spots and populated by song birds. On the western side of the ravine, the steep, high cliffs are bright with the myriad colors of wild flowers. Scattered through the gardens are groups of statuary depicting familiar scenes from fairy tales. Tucked among the flowers and shrubs are tiny statues of gnomes and brownies. Fourteen miles of walks wind through the gardens, twisting, turning, offering a new and beautiful picture at every bend.

The Los Angeles County Health Department, under the administration of Dr. J. L. Pomeroy, has developed an outstanding example of the district health center idea, and the County in coöperation with the various districts, has erected beautiful buildings well designed for this type of public health administration. These centers are well worth visiting, and it is planned to hold the first Health Officers Section meeting in one of them.

All the world knows Pasadena—its fame as a city of homes—the place where the quest for an ideal has ended. The inviting hospitality of Pasadena, its famed hotels, its unique recreational features, the delightful resorts of the Pacific, the broad expanse and mystery of the desert beckons you. We want you to share our pleasures and enrich us with your presence.

View Over the Municipal Golf Course

EDITORIAL SECTION

Expressions of opinion and statements of supposed facts are published on authority of the writer under whose name they appear, and are not to be regarded as expressing the views of the American Public Health Association, unless such statements or opinions have been adopted by vote of the Association.

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STATE CONTROL OF MILK PRICES

THIRTY years ago the Supreme Court of the United States held that reasonable regulation of milk in the interests of the public health was a valid exercise of the police power of a state. Since that time this court has handed down a number of decisions sustaining the power of the states to regulate the sanitary production of milk, and upholding the right of the states to prohibit or prevent the entry of impure milk and diseased cattle, and to delegate the supervision of milk supplies to local health authorities.[1]

On March 5, 1934, the Supreme Court went even further when in a divided opinion it upheld the right of a state to determine the retail price of milk when an emergency exists. This noteworthy five to four decision sustained as constitutional a New York law which was adopted in April, 1933, as the result of an exhaustive legislative investigation of the dairy industry. This law authorized the creation of a State Milk Control Board, empowered it to fix wholesale prices to be charged or paid for milk, and required it to fix retail prices. The law, to be in effect only until March 31, 1934, unless extended, was upheld by the New York Court of Appeals and now has the sanction of the highest court of the land.

In this notable decision, Mr. Justice Roberts points out on behalf of the majority of the court that milk is an essential article of diet, that it must be properly safeguarded, that the dairy industry is of vast significance to the economic life of the people, that there is a huge surplus of milk, and that a satisfactory stabilization of prices for fluid milk requires that the burden of surplus milk be shared equally by all producers and distributors in the milk-shed. The opinion also states that milk is not a public utility, but that the milk industry is one that is subject to proper regulation in the public interest.

"Price control, like any other form of regulation," says the court in conclusion, "is unconstitutional only if arbitrary, discriminatory, or demonstrably

irrelevant to the policy the Legislature is free to adopt, and hence an unnecessary and unwarranted interference with individual liberty." In the opinion of the minority of the court, the price fixing of milk is not regulation, but improper management of and dictation to private business.

The effect of this decision will, however, be salutary, not only with respect to milk regulation, but to the whole recovery program. In previous editorials in this *Journal*[2] the problems of the dairy industry have been discussed, and it has been emphasized that an increased consumption of pure milk is essential to national health. It is the function of the health officer to enforce and maintain high standards of sanitary milk production and distribution and then to attempt to induce the public to use this high quality milk in beneficial quantities.

The economic and sanitary aspects of milk are so interrelated that they cannot be separated. Up to the time of the depression, milk consumption was increasing because of public confidence in the safety of market milk. Reasonable sanitary regulations, adequately enforced, tend to protect the reputable dealer as well as the public. Price fixing, if fair to all, accomplishes the same end, since it permits legitimate and honest business to sell milk at a small and reasonable profit and hold its trade without unfair competition from unscrupulous racketeers who are more interested in profits on low-priced milk than they are in pure and safe milk.

Both prices and sanitary regulations must of necessity be adapted to prevailing local conditions. Standards applicable to a metropolitan area in the North are obviously different from those governing a rural district in the South. But one thing is certain, and that is that any community can have clean and safe milk at a reasonable cost. One element in the attainment of that goal is the universal pasteurization of all milk, except certified.

Health officials should dedicate their efforts to this ideal, endeavoring at all times to maintain quality milk supplies, preferably pasteurized, and sufficiently attractive in purity and price so that the public will increase its consumption of our most nearly perfect and indispensable food.

REFERENCES

1. Tobey, J. A. *Public Health Law.* Williams & Wilkins, 1926. Also: The Legal Aspects of Milk Control. *Reprint No. 939.* U. S. Public Health Service.
2. Editorials: Milk Control and Public Health; and, Public Health and the Price of Milk. *A.J.P.H.* 24, 1:46–48 (Jan.), 1934.

REVISION OF THE FOOD AND DRUGS ACT

WE have already published one editorial[1] on the bill now before Congress providing for a revision of the Food and Drugs Act. We believe that as far as the protection of the public goes in this regard, this bill is second only in importance to the fight put up by the late Dr. Harvey W. Wiley. The editorial in question followed closely the resolutions adopted at our meeting in Indianapolis, which we reprint here, as they have been published only in the *Year Book*, and we desire to call them to the attention of all of our readers:

RESOLVED, that the American Public Health Association:

1. Express its confidence in the purposes and principles of the Federal Food and Drugs Act now before Congress for action; and
2. Solicit the support of all members of the Association to secure the enactment into law of the objectives of this revision, and
3. That this expression of the views of the Association be made a part of the record of this meeting.

Since that time the bill in question has been before committees; hearings have been held; and a very strong lobby for its defeat, or a modification of it which to all intents and purposes will defeat its chief objects, have been organized. Indeed, some modifications have been accepted by Senator Copeland who is responsible for it in the Senate, and a new one has been drafted by persons employed by the drug interests.

These bills are being carefully watched by food experts who are connected with our Association, and the *Journal* will report from time to time on the progress of events. It does not seem wise at the present time to take any particular stand further than has already been taken, but to watch developments. Our object now is to call our readers' attention to the resolutions already published by our Association and to urge them to keep in touch with what is going on in Washington concerning this bill. We cannot emphasize too strongly our belief that the matter is deserving of the most careful study on the part of all interested in public health and of the closest attention to the progress of events.

REFERENCE

1. *A.J.P.H.* Dec., 1933, p. 1295.

ORAL HYGIENE

ALMOST before the ink on our editorial (March, 1934), on oral hygiene was dry, there came to hand two publications[1, 2] which deserve wide reading. While we recognize and deplore the orgy of tooth pulling which the medical profession indulged in for several years for every ailment from pip to ingrowing toenails, but which has fortunately abated, we still feel that dentistry is too little considered by the general practitioner, who is apt to view it from cosmetic and nutritional angles, but not enough from the standpoint of general health.

For those doctors who still feel that dentistry is apart from medicine, we may point out that as early as 1561, it seems that the work of the great French surgeon Paré was influential in placing dentistry on a physiological basis, while, in 1771, the great English surgeon, John Hunter, published a book, *Natural History of the Human Teeth,* and 7 years later a second one, *A Practical Treatise on Diseases of the Teeth.*

To this day, Hunter's work is recognized as the first attempt at a classification of the teeth, and still stands practically as he made it. His studies on the anatomy of the tooth have seldom been equalled, and never surpassed, and today are the foundation stones upon which all such work stands. While Hunter apparently did not relate diseases of the teeth with systemic disturbances, he did appreciate the necessity of proper occlusion, pointing out that irregularities in the second dentition were more apt to occur in the upper jaw than the lower one, owing to the comparatively larger size of the permanent upper set of teeth than the lower. He went further and claimed that the teeth were more easily moved backward than forward, and were more apt to remain fixed when moved back than when moved in the opposite direction. Certainly when men like Hunter and Paré found it to their advantage to spend time on dentistry, it behooves us, with our present and greater knowledge, to do something of the same sort.

It seems that the first person to call serious attention to the danger of systemic involvement from infected teeth was Dr. Willoughby D. Miller, a collegiate graduate of the University of Michigan, and a dental graduate of the

University of Pennsylvania in 1879. After graduation he went to Berlin where he had the opportunity of working in bacteriology under Koch, and in 1889, wrote *Microörganisms of the Human Mouth.* In 1891 a second publication appeared, *The Human Mouth as a Focus of Infection,* and during the same year, a third, *Pathogenic Mouth Bacteria,* which contained 23 illustrations.

While this work attracted the attention of bacteriologists, there is not a great deal of evidence that it had much effect generally, though we must give particular credit to a number of dentists who recognized that something new, and of importance, had been introduced into the practice of dentistry. The great awakening of the medical profession to the danger of oral sepsis was due to Sir William Hunter who, as early as 1900, published his book, *Oral Sepsis,* which fell on deaf ears, but who in Montreal, October, 1910, gave an address on "The Rôle of Sepsis and of Antisepsis in Medicine," which had a marked effect.

Perhaps the great majority of American physicians will credit this medical awakening to the late Dr. Frank Billings, who wrote on the effect of localized infections in endocarditis in an article called "Mouth Infection as a Source of Systemic Disease,"[3] and also published his book, *Focal Infection.*

The first dental college was organized in Baltimore in 1840 by Drs. Horace H. Hayden and Chapin A. Harris. These men tried to inaugurate the teaching of dentistry in relation to medicine at the University of Maryland, but the authorities lost the opportunity of founding the first university school of dentistry by rejecting the offer, and the institution founded by them was devoted specifically to the education of dentists. However, Dr. Harris is credited as being the pioneer through whose efforts dentistry became a recognized specialty of the healing art. In reading the biographies of prominent dentists, one finds a surprisingly large number who obtained their training at this school. In addition to his service in helping to found the first school for dentists, Dr. Hayden called the convention to order when the American Society of Dental Surgeons was formed in August, 1840, while Dr. Harris was the first editor of the first dental journal, 1839. Other facts show that Dr. Harris was interested in the teaching of dentistry before the foundation of the Baltimore College.

Harvard University, in 1868, was the first university to found a dental school in connection with a university, where the degree D.M.D. is still given, which some of the dental profession interpret as indicating some degree of condescension toward the dental profession as such. The first dean of the Harvard School was Dr. Nathan C. Keep, who served an apprenticeship in dentistry, then obtained the degree of Doctor of Medicine at Harvard in 1827. Dr. Keep will be remembered by many in connection with the Webster-Parkman murder case, as it was he who identified the remains of the victim by the dental work in Dr. Parkman's mouth, which he had done. The University of Michigan followed Harvard in establishing a dental school in 1875, and next, the University of Pennsylvania established its School of Dentistry in 1878. Many other dental schools in connection with universities now exist, the private dental school, like the private medical school, having largely gone out of existence, aided by the survey of the Carnegie Foundation begun in 1922.

The year before the founding of the Baltimore College of Dental Surgery, the *American Journal of Dental Science* was founded, and in 1840, the American Society of Dental Surgeons came into being.

It is to be regretted that more about dentistry as a profession cannot be included here. Perhaps the next step forward was the study of oral surgery,

which had a profound influence on the profession of dentistry. Oral surgery in some ways touches more closely the medical profession, including surgeons, than does dentistry. It is stated that until comparatively recently there were only two textbooks on oral surgery available, one which Dr. James E. Garretson published first in 1869, and the other by Dr. John S. Marshall. In 1900, Dr. Thomas L. Gilmer published the lectures given to the senior class of the Northwestern Dental School, but on account of the scarcity of literature up to a few years ago, oral surgery was taught largely as a didactic subject.

The men who may be credited with having done much to put the subject on a firm basis are Dr. Matthew W. Cryer, who became Professor of Oral Surgery at the University of Pennsylvania in 1896, Dr. Truman W. Brophy, of the Chicago College of Dental Surgery, Dr. Thomas L. Gilmer, of Northwestern University, and Dr. Cyrenus G. Darling, of the University of Michigan. Both Drs. Brophy and Cryer were students of Garretson, and at one time Dr. Cryer was his first assistant. The subject of dental surgery is now well established. During the World War dentists and oral surgeons had unusual experiences and did a tremendous amount in the scientific treatment of fractures of the jaws and in restoring the facial contour to desperately wounded soldiers.

Space does not permit of the mention of all who deserve credit in this line of work. The great object of this editorial is to interest practitioners in what is unquestionably a most important specialty of the healing art, and to encourage the reading of history which will show how much we owe to a profession which is too widely separated from the average physician of the present day. May both professions recognize their opportunities and come closer together for the benefit of mankind.

REFERENCES

1. *Dental Cosmos*, Jan., 1934.
2. Mellanby, May. Diet and the Teeth. *Special Report Series*, No. 191, Medical Research Council, 1934.
3. *J.A.M.A.*, 1904.

ASSOCIATION NEWS

RURAL HEALTH CONSERVATION CONTEST LAUNCHED

W. K. Kellogg Foundation Makes Possible New Rural Health Conservation Contest

FOR the first time whole-time county and district health units throughout the United States will have an opportunity, this year, of participating in a national health contest such as the cities of the country have been competing in for the past five years.

This contest is made possible through a generous grant from the W. K. Kellogg Foundation of Battle Creek, Michigan. As many of our readers know, it is this same W. K. Kellogg Foundation which is carrying on such interesting and promising studies and experiments in rural public health work in its several units in Michigan.

The Inter-Chamber Rural Health Conservation Contest, like the City

Contest, is carried on by the Chamber of Commerce of the United States in coöperation with the American Public Health Association. The purpose of this new contest is to promote sound rural public health practices, particularly through interesting the business man in public health and fostering a more effective coöperation, coördination and integration of the work of the several organizations and groups interested in, or carrying on, public health programs. This competition will be conducted along lines similar to the City Contest except that only full-time county health departments or district health units will be eligible to participate. The only requirements for enrollment are that the county or district health units have a full-time health officer and that such county or unit be entered by a chamber of commerce located in the county or district and affiliated with the Chamber of Commerce of the United States. Already some fifty counties have signified their intention of enrolling.

Further data on the contest are available either from the Insurance Department, Chamber of Commerce of the United States, Washington, D. C., or the Committee on Administrative Practice, American Public Health Association, 50 West 50th Street, New York City.

SCIENTIFIC OR EDUCATIONAL EXHIBITS

FOR a number of years the American Public Health Association has had in connection with its Annual Meeting a non-commercial exhibit variously referred to as the Scientific or Educational Exhibit. Last year a special committee of the Association was appointed to take charge of this exhibit and develop it for the greater interest of the delegates. In the exhibit presented at the Indianapolis Convention a beginning was made in this direction.

It is the ambition of the Committee on Scientific Exhibits to develop a feature for our Annual Meetings which in its way may be as valuable a contribution to the Annual Meeting as are the papers on the programs of the scientific sessions. We believe that there are many important activities in the public health field which can be presented better through the use of the exhibit method than by the presentation of a paper.

The committee requests that any member of the Association who has some new, interesting, or important matter to present, which lends itself to presentation by the exhibit method, get in touch with the committee through the Association office.

The committee, of course, reserves the same right as the Program Committee, to accept material offered within the limits of the space available. The committee is naturally desirous that material prepared for the Scientific Exhibit be interesting as to method of presentation as well as to content, yet we appreciate that expert technic and unlimited facilities for the preparation of an exhibit are not available to all public health workers. Members of the committee are therefore ready to offer suggestions and advice to prospective exhibitors.

Communications for the committee should be addressed to Homer N. Calver, Chairman of the Committee on Scientific Exhibits, American Public Health Association, 50 West 50th St., New York.

NEW MEMBERS

The following list includes applicants who have been approved for membership in the A.P.H.A. by the Sub-Committee on Eligibility. These new members have requested affiliation with the sections indicated, and action by the Section Councils will follow.

Health Officers Section

George R. Allen, M.D., Champlain, N. Y., Health Officer

Joseph W. Belser, M.D., East Greenbush, N. Y., Acting Health Officer

Lewis E. Bratt, M.D., Akron, N. Y., Health Officer

Robert Brittain, M.D., Downsville, N. Y., Health Officer

Marshall W. Brown, M.D., 73 W. Main St., Babylon, N. Y., Health Officer

Ralph Frazier, M.D., Bergen, N. Y., Health Officer

Donald B. Glezen, M.D., Cincinnatus, N. Y., Health Officer

Norman G. Gridley, M.D., 404 Main St., Horseheads, N. Y., Health Officer

Francois Guimont, M.D., Pointe Basse, Iles de la Madeleine, P. Que., Canada, Medical Officer of Health

Joseph Gutfreund, M.D., Eldred, N. Y., Health Officer

Clifford H. Harville, M.D., 88 N. Main St., Warsaw, N. Y., Health Officer

Aaron I. Levis, M.D., Madison, N. Y., Health Officer

Louis A. Luttge, M.D., 42 Central Blvd., Central Park, L. I., N. Y., Assistant, Social Hygiene Clinic, Nassau County Public Health Commission; Taking Health Officers Course

George A. McQuilkin, M.D., Varysburg, N. Y., Health Officer

Alvia R. Morrow, M.D., Cazenovia, N. Y., Health Officer

Ray P. Moyer, M.D., 620 City-County Bldg., Pittsburgh, Pa., Director, Pittsburgh Department of Public Health

William D. Peckham, M.D., 1207 State St., Utica, N. Y., Health Officer, Consolidated Health District of Marcy and Floyd

Paul S. Persons, M.D., 22 E. Main St., Ripley, N. Y., Health Officer

Robert S. Pratt, 5725 Main St., Williamsville, N. Y., Taking Health Officers Course (Assoc.)

Burton L. Rockwell, M.D., Oriskany Falls, N. Y., Health Officer, Augusta Marshall Townships

Baylis F. Sloan, M.D., Walhalla, S. C., Medical Director, Oconee County Health Department

Herbert B. Smith, M.D., 143 Pine St., Corning, N. Y., Commissioner of Health

Claude H. Vadney, M.D., Lyons Falls, N. Y., Health Officer

Laboratory Section

Dr. Tomas Padro y Alvarez, Heredia alta 15, Stgo de Cuba, Orte, Cuba, Chief Chemist of the Laboratories of the Sanatorium of the Spanish Colony in Central Gallego

Dr. Leasure Kline Darbaker, 424 Franklin Ave., Pittsburgh, Pa., Professor of Microbiology, Pittsburgh College Pharmacy

Nelle M. Fishel, B.S., City Hall, Des Moines, Ia., City Bacteriologist

Clifford D. Gallagher, M.D., Faxton Hospital, Utica, N. Y., Director of Hospital Laboratory

Margaret Hotchkiss, Ph.D., 146 Halsey St., Brooklyn, N. Y., Instructor in Bacteriology, Public Health, etc., N. Y. Homeopathic Medical College and Flower Hospital

George Ives, M.D., 3720 Washington Blvd., St. Louis, Mo., Clinical Pathologist

Alfred W. Jackson, M.D., D.V.M., 124 Main St., Albion, N. Y., Health Officer

Samuel T. Lindsay, M.D., St. Mary's Hospital, Rochester, N. Y., Laboratory Director

Howard C. Maffitt, 522 Eleventh St., Des Moines, Ia., Consulting Chemist

Maurice R. Moore, M.D., W. W. Backus Hospital, Norwich, Conn., Director of Laboratory

Theodore A. Olson, B.S., State Dept. of Health, Div. of Sanitation, Minneapolis, Minn., Biologist

Clarence C. Ruchhoft, B.S., 845 S. Wabash Ave., Chicago, Ill., Bacteriologist, Sanitary District

Joseph I. Schleifstein, M.D., 785 Park Ave., Albany, N. Y., Associate Diagnostic Pathologist, Div. of Laboratories and Research, State Department of Health

Gustav Selbach, M.D., 66 Elizabeth St., Dansville, N. Y., Director, Livingston County Laboratory

Harold L. Smith, B.A., 217 Park Place, Ashtabula, O., Bacteriologist

Geral A. Vacha, M.S., Rm. 527, State Office Bldg., St. Paul, Minn., State Bacteriologist

Public Health Engineering Section

Roy M. Harris, B.S., 1504 Alaska Bldg., Seattle, Wash., P. H. Engineer, State Department of Health

Eugene O. Leonard, Ph.G., Department of Health, Pocatello, Idaho, City Chemist

Gustavo Noguera S., Apartado 1509, Bogota, Columbia, S. A., Chief Engineer, National Public Health Department (Assoc.)

Carlos B. Ruiz, Apartado No. 76, Torreon, Mexico, Manager, Torreon Water Works
Lynn M. Thatcher, 126 State Capitol, Salt Lake City, Utah, State Sanitary Engineer

Public Health Nursing Section

Luella Tanner, R.N., P.H.N., Hoolehua, Molokai, T. H., Public Health Nurse
Ruth Tappan, R.N., 225 N. Washington Ave., Battle Creek, Mich., Director, Crippled Children's Service, W. K. Kellogg Foundation
Cora Warrant, R.N., 130 Spring St., Rochester, N. Y., Director, Public Health Nursing Association

Industrial Hygiene Section

Clarence E. Ralston, Pittsburgh Plate Glass Co., Grant Bldg., Pittsburgh, Pa., Safety Director (Assoc.)
Martin E. Tyrrell, M.D., Transit Road, Depew, N. Y., Health Officer and Industrial Physician

Child Hygiene Section

Marguerite Holman, M.D., 56 Grant St., Jamestown, N. Y., School Physician
Robert R. McCormick, M.D., 204 W. Main St., Endicott, N. Y., Industrial Physician
Dominic M. Nigro, M.D., 512 Argyle Bldg., Kansas City, Mo., Commissioner, Child Hygiene

Public Health Education Section

Harrison A. Allen, M.D., Box 66, Endicott, N. Y., Medical Supervisor of Schools
May M. Brown, 132 W. First St., Los Angeles, Calif., Librarian, Los Angeles County Health Department (Assoc.)
A. Morris Ginsberg, M.D., 724 Argyle Bldg, Kansas City, Mo., Chairman, Heart Committee, Health Conservation Association
Arthur F. Hall, Jr., M.D., Lincoln National Life Foundation, Fort Wayne, Ind., Assistant Director, Life Conservation Division
Marie C. Harrington, M.A., 609 Chamber of Commerce Bldg., St. Louis, Mo., Health Education Director, St. Louis District Dairy Council
Virginia M. Palmer, M.D., 5 Valley Road, Scarsdale, N. Y., Medical Inspector, White Plains Public Schools
C. R. Skinner, M.D., 447 Warren St., Hudson, N. Y., Deputy Health Commissioner and School Physician
Myral M. Sutherland, R.N., Mary McClellan Hospital, Cambridge, N. Y., Superintendent
Mary H. Westfall, D.D.S., 804 Odd Fellow Bldg., Indianapolis, Ind., State Director, Good Teeth Council for Children

Epidemiology Section

Florence B. Benell, M.S.P.H., 3500 W. 12th Place, Chicago, Ill., Student (Assoc.)
John E. Gordon, Ph.D., M.D., Herman Kiefer Hospital, Detroit, Mich., Medical Director, Division of Epidemiology

Unaffiliated

David M. Hackwell, M.D., Holland, N. Y., Health Officer
Foster Murray, M.D., 80 Hanson Place, Brooklyn, N. Y., Director, Tuberculosis Division, Kingston Avenue Hospital
George A. Taylor, 451 Century Bldg., Pittsburgh, Pa., Secretary, Pittsburgh District Dairy Council

Sustaining Member

Lincoln National Life Foundation, Fort Wayne, Ind.

DECEASED MEMBERS

N. J. Randolph Chandler, Plainfield, N. J.. Elected Member 1914, Fellow 1923
J. Frederick Hempel, M.D., Baltimore, Md., Elected Member 1920, Fellow 1923
William Herbert Lowe, D.V.S., Paterson. N. J., Elected Member 1906, Fellow 1923
William L. Munson, M.D., Granville, N. Y., Elected Member 1919, Fellow 1922
Linsly R. Williams, M.D., New York, N. Y., Elected Member 1914, Fellow 1922
Edward J. Denning, M.D., Boston, Mass., Elected Member 1919
W. S. Downham, M.D., London, Ont., Canada, Elected Member 1919
Pierre G. Fermier, M.D., Leesburg, Ind., Elected Member 1931
C. P. Fryer, M.D., Dr.P.H., Maryville, Mo., Elected Member 1922
Alfred F. Hess, M.D., New York, N. Y., Elected Member 1913
Wyman D. Jacobs, M.D., Averill Park, N. Y., Elected Member 1926
Joseph E. Masson, M.D., D.P.H., Montreal, P. Que., Canada, Elected Member 1933
J. S. McBride, M.D., Seattle, Wash., Elected Member 1933
Dr. Gaston Melo, Mexico, D. F., Elected Member 1932
W. Ophuls, M.D., San Francisco, Calif., Elected Member 1920
S. M. Shoemaker, Eccleston, Md., Elected Member 1927
Arthur B. Chandler, Montreal, P. Que., Canada, Elected Member 1931
Charles H. Voorhies, M.D., Lexington, Ky., Elected Member 1921
Alonzo Blauvelt, M.D., New York, N. Y., Elected Member 1917
Prof. Henry W. Farnam, New Haven, Conn., Elected Member 1914

LABORATORY

STUDIES WITH STANDARD AGAR AS EMPLOYED IN MILK CONTROL WORK*

C. S. Bowers and G. J. Hucker

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I. A COMPARATIVE STUDY OF YEAST AND BEEF EXTRACT MEDIA

YEAST extract has been reported to be excellent for the cultivation of many different types of organisms which either do not develop generally on standard medium or whose colonies are so minute that they are observed with difficulty.

In order to determine whether the substitution of yeast extract for beef extract in standard medium would increase its efficiency when used to estimate the number of bacteria in milk, a series of 514 samples of raw and pasteurized milk were plated upon standard medium, standard medium with yeast extract substituted for beef extract, and plain peptone agar, and incubated at standard temperature. These samples were representative of the usual sources from which milk control laboratories receive samples; that is, directly from cows, from milk receiving stations, from different points in pasteurizing plant operation, from delivery vehicles, and from retail stores. In addition, they were representative samples of various grades of milk both raw and pasteurized.

The yeast extract counts of 373 raw milk samples were 9 per cent lower than those secured with standard agar, while the counts of 141 pasteurized milk samples were 20 per cent below the standard count. Standard medium produced a maximum plate count from 65 per cent of all samples included in the study while the yeast medium yielded the highest count in 25 per cent.

Slightly larger colonies developed in many instances on the yeast extract medium but this characteristic was not constant, since organisms which produced the pin-point type of colony were slightly larger on the yeast medium in some cases but in others the colonies were more minute than on the standard medium.

It is concluded that the advantages of yeast extract for the plating of fluid milk are insufficient to warrant its use as a substitute for beef extract in the standard medium.

II. THE EFFECT OF A MODIFIED STANDARD MEDIUM FOR THE DETERMINATION OF THE BACTERIAL FLORA OF MILK

Many workers engaged in the sanitary control of milk supplies have criticised standard medium because it has often failed to indicate the presence of certain types of organisms found in milk. As a result a plate count has frequently been secured which did not

* Read before the Laboratory Section of the American Public Health Association at the Sixty-second Annual Meeting in Indianapolis, Ind., October 12, 1933.

Approved by the Director of the New York State Agricultural Experiment Station for publication as *Journal Series No. 39.*

give an indication of the actual number or types of bacteria present. The results of the previous study confirmed the observation of others that yeast extract was more beneficial to some organisms than it was to others. As a consequence an additional investigation was begun in the Division of Bacteriology at the Agricultural Experiment Station in Geneva, N. Y., to ascertain whether the efficiency of modified standard medium could be enhanced by the addition of yeast extract, and to determine further if the inclusion of yeast extract in media was responsible for increased size of colonies.

In order to observe what effect the use of certain modifications of standard medium would have upon the number and types of bacteria which would develop from milk, the plate counts from a series of 27 normal and 23 abnormal raw and pasteurized milk samples were secured by employing standard agar with and without dextrose, yeast extract agar with and without dextrose, plain peptone agar, beef and yeast extract agar with and without peptone, and Difco yeast dextrose agar which contained beef extract, yeast extract, tryptophane broth, peptone and dextrose.

Samples of raw milk which were considered normal were composite samples from a herd at the Agricultural Experiment Station, from producers supplying milk to a pasteurizing plant in Geneva, N. Y., and from a receiving station at Oxford, N. Y. Some of the abnormal raw milk samples were secured from cows segregated from the station herd because of suspected mastitis, and others were from different samples of raw milk which were collected immediately after the evening milking and stored at 25° C. overnight.

Samples of normal pasteurized milk were taken from the plant at Geneva and others were received from New York City and Boston, Mass. Samples of pasteurized milk which were held at 10° C. for 12 days and pasteurized milk samples which were suspected of containing thermophilic bacteria were considered as abnormal pasteurized milk samples. Incubation of plates was at 32° C. and 37° C. for 48 ± 4 hours.

Difco yeast dextrose agar allowed the development of the greatest number of colonies in 45 per cent of all samples at standard incubation and in 48 per cent of all samples at 32° C. In no instance did standard medium give a maximum plate count. The addition of dextrose to standard medium resulted in higher plate counts than were secured with yeast extract plus dextrose, and the colony size was increased more by the addition of dextrose than by the addition of yeast extract to standard medium.

In the vast majority of cases all media were conducive to higher counts when plates were incubated at 32° C. than at standard temperature. Standard medium plate counts were higher at 32° C. than at 37° C. in 86 per cent of the cases. However, the effect of the difference in temperature of incubation upon the magnitude of the count was less appreciable when yeast extract was added to standard medium; only 56 per cent of the standard medium plus yeast extract counts were higher at 32° C. than at 37° C. Counts secured with Difco yeast dextrose medium and incubated at 32° C. were approximately 4 times as great as those secured with standard medium at standard temperature.

In the authors' opinion too little consideration has been given in the past to the ease with which the number of colonies appearing on a plate can be counted. Standard agar is a gross offender in this respect and it was exceedingly noticeable in the present study, since all media, with the exception of plain peptone in a few instances, yielded colonies which were larger than those on standard agar. Usually these

colonies could be counted with ease by the naked eye and without the aid of artificial illumination. On the other hand, it is quite apparent that any successful attempt to do away with the troublesome problem of minute colonies must also result in higher plate counts. The problem seems to be one which is due to unsatisfactory nutriment more than one of time and temperature.

From the results of this study it is concluded that:

Yeast extract is not superior to beef extract for plating both raw and pasteurized milk.

The combination of yeast and beef extract in a medium for milk plating is more efficient than the use of either one separately.

Neither yeast extract nor beef extract materially increases the number of colonies over plain peptone agar.

The addition of a fermentable carbohydrate to standard medium generally causes an appreciable increase in count and colony size.

The addition of glucose to standard medium increases the count approximately 2½ times more than the addition of yeast extract.

Counts obtained with the present standard temperature may give a false impression of the actual number of bacteria present in milk.

THE MECHANISM OF BACTERIOPHAGE LYSIS*

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ON the basis of experimental evidence secured in the study of the mechanism of lysis in the presence of moderate initial concentrations of bacteriophage, the conclusion was reached that progressive disappearance of organisms during the period of phage regeneration (and before its concentration has reached the maximum level) is due to bursting. This is brought about through an increase in the rate of cellular metabolism, which results in the increase in osmotic pressure and imbibition of water, leading to swelling and finally to disruption of cells.

However, if the concentration of phage is initially at a limiting level, or when it approaches this level as the result of regeneration, the susceptible bacteria are killed and subsequently digested without undergoing the changes just described.

By setting up a competition for water between the bacteria and the medium (as in the case of 4 per cent agar, for instance), both the swelling and lysis of bacteria are prevented. However, if to such a medium is added 4–5 per cent of urea, both the swelling and the lysis of bacteria again take place.

On the other hand, while increase in competition for water prevents both the swelling and lysis of bacteria, the effects of the presence of phage are not totally abolished. Indeed, bacteria which come in contact with phage under these conditions still exhibit heightened metabolic activity, as indicated by marked increase in the rate of multiplication. While this effect is particularly marked under the conditions which preclude lysis, the growth-promoting effect of phage can be detected also under the

* Abstract of paper read before the Laboratory Section of the American Public Health Association at the Sixty-second Annual Meeting at Indianapolis, Ind., October 11, 1933.

ordinary conditions when the lysis is not inhibited, particularly on ordinary solid media. Moreover, if the initial concentration of phage is kept sufficiently low, so that the obscuring effect of concomitant lysis of progressively increasing numbers of bacteria is minimized, it is possible to detect this growth-promoting effect in ordinary broth cultures, both in terms of turbidity changes of the whole culture and by count of surviving bacteria.

Thus it appears that the primary effect of phage consists in the stimulation of bacterial metabolism. This effect can be elicited under all conditions employed in these experiments, irrespective of whether lysis takes place or not.

The lysis proper is a secondary phenomenon, which occurs as a direct result of imbibition of water by the bacteria following the osmotic changes set up by the increased metabolism. Whenever this imbibition of water is interfered with, the lysis is prevented.

VITAL STATISTICS

Birth Rates and Illegitimate Births in Germany and Other European Countries—In 1932 Germany, Italy, and Poland had a marked decline in the birth rate. In the German reich the number of living births receded by 53,600. In Italy the number of living births was 34,150 fewer than in 1931, so that in 1932 the birth rate for Italy was only 23.8 per 1,000, as compared with 24.9 per 1,000 the previous year and 26.7 in 1930. In Poland in 1931, 50,000 fewer births were recorded, and in 1932 there was a further decline of nearly 34,000; the birth rate of Poland dropped, over the 2-year period, from 32.3 (1930) to 28.7 per 1,000 population. In the remaining countries of western, central, and northern Europe the decline in the birth rate ranged from 0.2 to 0.7 per 1,000. France had a decline in its birth rate of only 0.2 per 1,000. In Sweden and Hungary the birth rate was only 0.2 and 0.3 per 1,000 population, respectively, lower than in 1931, whereas Great Britain and Czechoslovakia showed a decline of 0.5 and Austria a drop of 0.7 per 1,000. Unchanged birth rates were recorded in the Netherlands and in Switzerland.

The countries of lowest birth rates at present are the German reich, Austria, Sweden, and Great Britain, with birth rates ranging from 14.5 to 15.8 per 1,000. France (with a birth rate of 17.2), Belgium (18.1), and Switzerland (16.7) have in recent years passed out of the group of nations with the lowest birth rates. The birth rates in Norway (16.7), Denmark (18.0), and Finland (19.5), together with Lithuania and Estonia, range around that of France and in some cases exceed it. In countries bordering on this area, limitation of births is making further progress, particularly in Czechoslovakia, Hungary and Italy, which countries report, in contrast to former high rates, birth rates of from 21 to 24 per 1,000, which are lower than the birth rate of the German reich in 1923 (26.9). The birth rates in the countries of the Iberian peninsula (28.3 and 30.7) and in eastern and southeastern Europe are still high. There appears to be evidence, however, that the demographic pressure of the Slavic races of the East

will in the near future lose considerable of its force. It may be added that in 1932 the population of Japan increased by 1,007,868 (in 1931, by 861,534).

The percentage of illegitimate births in Germany (12.1) is exceeded by that of only one European country (Sweden with a percentage of 16.1). The corresponding percentage in Greece is 1.4; Bulgaria, 4.0; Great Britain, 4.6; Italy, 4.9; Norway, 7.1; France, 8.4; and Denmark and Czechoslovakia, 10.7.—*J.A.M.A.* 102:308 (Jan. 27), 1934.

Health Conditions in New York State, 1933—In attempting to evaluate the effects of the fourth year of the intense economic depression upon the health of the people of New York State, it is essential to realize that vital statistics, or to use the more comprehensive term, demography, can give us only a partial picture of the situation. In 1933, as could be anticipated, the downward trend of the birth rate continued. At the same time, the marriage rate has risen about the minimum for the preceding year.

The general death rate of 11.2 per 1,000 population, however, is the lowest ever recorded in the state. The significance of this fact is likely to be misunderstood or misinterpreted. Some superficial, and one might say callous observers have stated that the drop in the death rate indicates the beneficent effects of economic deprivation. This, of course, is not true. All that one can say is that official and private aid has not permitted the workers who were thrown out of their jobs to starve to death; that official and private health agencies have been able, in the face of increasing difficulties, to carry on and even to expand their preventive and curative activities.

The number of marriages recorded in the entire state in 1933 was 106,295, an increase of more than 5,000 over the preceding year; the marriage rate was 16.0 per 1,000 population as compared with 15.5 in 1932. The 1933 birth rate of the entire state was 14.0, the lowest ever recorded. The number of births was less than in 1932 by almost 13,000. With but few exceptions, the birth rate of the state has been moving downward since 1914 when the maximum figure of 24.6 was recorded. In the brief interval 1927–1933 it has dropped more than 25 per cent—from 19.0 to the present minimum of 14.0.

The rate of infant mortality, 54 deaths under 1 year per 1,000 live births, was practically equal to the minimum recorded in 1932. The disquieting rise in maternal mortality, which was first noted in 1930, continued; the 1933 rate, 60 deaths per 10,000 total births, was the highest in 15 years. The increase above the rate of 1932 was due entirely to a rise in the mortality from puerperal sepsis, the rate for the former year being 18.5 and the 1933 rate, 19.9.

Death rates from several important causes established new minimums for all years. The rates from whooping cough (2.2 per 100,000 population) and diphtheria (1.1) have never been lower; the latter was about half of the previous minimum of 2.1 registered in 1932. The pneumonia death rate (91.2) has never been lower; rates below 100 were recorded only twice before, in 1921 and in 1932.

Of the diseases that are most directly influenced by economic want, tuberculosis undoubtedly is one of prime importance, and yet its death rate has dropped to the lowest point in the history of the state (59.0)—a reduction of more than 50 per cent since 1920.

In view of the nation-wide attention focused upon lethargic encephalitis by the St. Louis epidemic, it is interesting

to note that the mortality from this cause in New York State (0.6) has never been lower.

Compared with 1932, decreases were recorded in mortality from scarlet fever (1.7) and diseases of the heart (289.6). The mortality from alcoholism (4.7) has not been lower since 1922, and the rates of suicide (17.4) and homicide (5.3) were the lowest since 1929. The death rate from fatal accidents (67.8) has been lower only once. Noteworthy in this group is the reduction of fatal automobile accidents, the rate (21.1) being the lowest since 1926; the highest rate ever recorded in the state was 25.5 in 1929.

Among the more important negative facts is the rise of the death rates from cancer (127.5) and diabetes (30.3) to new maximums; the measles death rate (2.5) was the highest in 5 years; there was also a slight increase in the mortality from diarrhea and enteritis among children under 2 years of age, the rate being 6.8 compared with the minimum of 6.5 in 1932.—*New York State Health News.* 11:29–30 (Feb. 19), 1934.

INDUSTRIAL HYGIENE

Some **Cases of Carbon Tetrachloride Poisoning in Connection with Dry Shampooing and Dry Cleaning with a Survey of the Use and Action of the Substance**—The action of carbon tetrachloride on the human organism is discussed. Carbon tetrachloride has a protoplasmic-injuring action with the same narcotic potency as chloroform. Occupational carbon tetrachloride intoxication presents a rather characteristic picture which consists of a headache accompanied by nausea and vomiting, with a subsequent development of hepatitis or nephritis with their characteristic symptoms.

Several uses of carbon tetrachloride and the accompanying dangers are discussed. This substance is used largely in place of benzine for the removal of grease, extraction of fats, solvent for crude rubber, fire extinguishers, and as an anthelmintic drug. It has also found a popular use in Denmark in connection with shampooing. Several histories of carbon tetrachloride intoxication from this as from other occupational sources are given and discussed.

The author feels that carbon tetrachloride can be used more advantageously than benzine as a solvent if the public can be instructed as to the toxicity of the substance and methods of handling it without danger to life and health. Carbon tetrachloride would be, however, prohibited as a shampoo.—Knud O. Moller, *J. Indust. Hyg.,* XV, 6:418–431 (Nov.), 1933.

L. G.

Health Aspects of Radium Dial Painting. III. Measurements of Radioactivity in Workers — This study considers the amount of radioactive substance found in the living human body by the measurement of radioactivity in the workers employed in the radium dial painting industry. Gamma ray, radon and thoron determinations were made by various electroscopic tests which are described in detail. The average gamma micrograms of radium readings are as follows: radium transfer press operators, +0.16; painters from +0.23 to +1.70; and dusters, +1.03. The probable error of measurement in the tests was about 0.3 micrograms.

The results of the study showed that

high gamma-ray concentrations were confirmed by high radon or thoron readings, or both, indicating that in general individuals giving a high gamma-ray reading are radioactive. There is little evidence to believe that the radium dial painters would become radioactive during the first year of service, but after the first year there seems to be definite evidence of the accumulation of radioactive material. There was, however, little correlation between radioactivity and length of exposure. Other factors such as degree of exposure, personal cleanliness, working conditions (factory housekeeping), and individual susceptibility were of greater importance. There was definite indication that the accumulation of radium in the body of the workers was associated with the degree of radioactivity of the atmospheric dust to which they were exposed.

In order to have some standard of comparison electroscopic determinations of a known quantity of radium emanation distributed in a cadaver were made. Radon seed was injected into the body and measurements were taken with the cadaver arranged in an identical position as when determinations were made on workers. Finally the sensitivity of the electroscope was checked against a 10 mg. standard of radium.—James E. Ives, Fred L. Knowles, and Rollo H. Britten, *J. Indust. Hyg.*, XV, 6:433–446 (Nov.), 1933. L. G.

Health Aspects of Radium Dial Painting. IV. Medical and Dental Phases—This paper concludes the report of an investigation of the radium dial painting industry by the U. S. Public Health Service, and deals with the medical and dental phases of the problem. The results of this study indicate no correlation between radioactivity or exposure to radium and blood pressure changes, radium burns, or change in finger prints. Slight reduction in the red cells count showed 4.3 million R.B.C. per c.c. for 196 women radium workers as compared with 4.5 million per c.c. for the 31 controls, and in the hemoglobin determination which gave an average of 13.2 gm. per 100 c.c. of blood for 196 women radium workers, and 14.0 gm. per 100 c.c. for the 31 controls. The change in the total white cell count was not significant.

Examination of mouth, teeth, and bone showed no stomatitis such as might be associated with metallic poisoning but disclosed focal atrophy and focal sclerosis. There was definite relation between these dental findings and exposure to radium. Workers having more than 4 micrograms of radium showed bone changes.—Louis Schwartz, F. C. Makepeace and H. T. Dean, *J. Indust. Hyg.*, XV, 6:447–455 (Nov.), 1933. L. G.

Experimental Inhalation of Bituminous Coal Dust and Its Effects Upon Primary Tuberculosis Infection in Guinea Pigs—This study was carried out in an industrial plant where experimental animals were exposed to an average concentration of 84 million particles of coal dust under 10 microns in diameter per cu. ft. of air. The coal was characterized by a high carbon content and a relatively small amount of volatile matter and silica. The animals were divided into five small groups which consisted of: (1) normal guinea pigs exposed for varying intervals to the inhalation of soft coal dust to produce maximal reaction in their lungs; (2) guinea pigs infected with attenuated tubercle bacilli 10 days before initial dust exposure; (3) presumably uninfected anthracotic guinea pigs which were infected by the inhalation of attenuated tubercle bacilli 115

days after the completion of 1 year and 9 months' dust exposure; (4) guinea pigs similar to the preceding group except that the animals were infected by the inhalation of a more recently isolated strain (H 60) of human tubercle bacilli of moderate virulence; and (5) animals infected with virulent tubercle bacilli 10 days previous to exposure in the plant.

The results of the experiments seemed to indicate the following: (1) soft coal did not penetrate the lungs as much as quartz or carborundum. There is little cellular fibrosis in the connective tissue sheaths of bronchi and blood vessels but rather a more marked fibrotic action in the medulla of the mediastinal lymph nodes. The general nature of the reaction is comparable to that observed in the human lung; (2) soft coal dust is eliminated rather slowly from the lungs of guinea pigs (three years after discontinuing an exposure 2 years in duration, subpleural pigmentation was still marked); (3) there may be some protective action by inhaled bituminous coal dust against the development of a tuberculous infection.—Leroy U. Gardner, Donald E. Cummings and Gerald S. Dowd, *J. Indust. Hyg.*, XV, 6:456–465 (Nov.), 1933. L. G.

Time Limitation in Compensation for Industrial Diseases—The difficulties experienced in the application of a time limit in compensation cases for occupational diseases in New York State and Minnesota is discussed. The phraseology of the law is such that the time limit for compensation claims provides a difficult medico-legal problem. This is particularly true when the industrial diseases are cumulative in character.

The author advocates the adoption of a time limit in industrial compensation laws which is, in one way or another, specifically related to the time of leaving the employment. The time limitation would then be more or less determinable and would avoid controversies experienced by the compensation legislation of New York State and Minnesota, which bases the time limitation upon the date when an occupational disease is "contracted."—May R. Mayers, *J. Indust. Hyg.*, XV, 6: 465–472 (Nov.), 1933. L. G.

Bureau of Mines Approved Devices for Respiratory Protection—This article deals with the activities of the Bureau of Mines in preparing minimum requirements for safety and durability of respiratory devices, and devising tests to ascertain the ability of the equipment to meet the requirements before giving approval to them. Specifications and tests have been prepared for self-contained oxygen breathing apparatus, canister gas masks and for hose masks. Any equipment which has been granted an approval by the Bureau of Mines is required to maintain approval standards. The Bureau of Mines has done much to stimulate the production of improved respiratory devices as well as to protect the consumer from faulty and unsatisfactory devices for respiratory protection. A selected list of references to respiratory devices is given.—W. P. Yant, *J. Indust. Hyg.*, XV, 6:473–480 (Nov.), 1933. L. G.

Diurnal and Seasonal Variations in the Small Ion Content of Outdoor and Indoor Air—This is a study of the ionic content of outdoor and indoor air conducted at the Harvard School of Public Health at Boston, Mass. Daily ion counts (small ions) were made over a period of 3 years, between May, 1930, and May, 1933.

The results of the study indicate a definite diurnal and seasonal variation

in the ionic content of the atmosphere depending largely upon local and general meteorological conditions. Daily peaks occurred shortly after mid-day and mid-night, and the low points occurred between 6 and 10 p.m., and 4 and 8 a.m. There was a distinct seasonal maximum during the summer months and a minimum during the winter months.

Interdiurnal changes of temperature and humidity appeared to be the most important climatic factor affecting the small ion content of outdoor air. A drop in the interdiurnal temperature and humidity was preceded or accompanied by a sharp rise in the ion content of the air and *vice versa*, provided that the drop or rise in temperature and humidity did not continue for more than 2 days.

Cloudiness, high humidities and precipitation seemed to influence the ionic content of the atmosphere. Significant reductions in the number of small ions were noted at all seasons. Heavy precipitation resulted in a considerable increase in negative ions from the Lenard effect.

It was found that the concentration of small ions in indoor air was considerably lower than that in the outdoor air in the winter. In the summer the reverse held true. Persistent bad weather tended to equalize the indoor and outdoor ion content.—C. P. Yaglou and L. C. Benjamin, *Heating, Piping & Air Cond.*, 6, 1:25–32 (Jan.), 1934.

The Therapeutic Uses of Polarized Air—The ionic content of the atmosphere is being recognized as appearing to be of great medical importance. This study presents the results of polarized air treatment of 84 patients to whom 1,200 treatments were administered. Each treatment extended over a period of 15 minutes and the doses administered varied from 10 to 20 million ions per c.c. of air. The results of the treatments are as follows:

Diagnosis	*Improvement*	*Moderate Improvement*	*No Improvement*	*Patients / Treatments*
Sinusitis	6	13	14	16
Asthma	2	8	5	6
Ess. Hypertension	4	1	1	2
Vasomotor Rhinitis	3	—	—	2
Atrophic Rhinitis	—	—	1	—

While the experimental series is too small to permit any definite conclusions, the author feels that this procedure shows therapeutic possibilities in certain types of sinusitis, asthma, essential hypertension, and vasomotor rhinitis.

There is a general discussion of ions with particular reference to the type, size, velocity and distribution of ions in the atmosphere. Methods of producing ions are briefly discussed and a description of the Dessauer Ionization Apparatus is given.—William Bierman, *Arch. Phys. Therapy, X-Ray, Radium*, XIV:133–137 (Mar.), 1933. L. G.

"Nose-Opening" Rays—This study repeats the work of Leonard Hill, who claims that all dark sources of heat are "nose-shutters," and that bright, incandescent sources of heat act as "nose-openers." Blind persons were chosen as subjects to rule out certain psychic factors which Hill claimed were acting as inhibitors of the phenomena. The subjects were seated in a chair screened from drafts and light, by a shelter, and exposed to a bright source and then to a dark source of heat for a certain interval. Inspiratory and respiratory pressure were recorded by a sensitive manometer of the aneroid type which was connected to one nostril.

The results of the study failed to confirm Hill's observations and indicated that the "nose-closing" is probably caused by any rapid warming of the skin and that it is not dependent upon any particular quality of radiation. Screening from the heat source or sponging a small area of the skin with

cold water gave immediate relief in the experiments.—A. F. Dufton and T. Bedford, *J. Hyg.*, XXXIII, 4:476–484 (Nov.), 1933. L. G.

The **Mortality Experience of an Occupational Group Exposed to Silica Dust Compared with that of the General Population and an Occupational Group Exposed to Dust Not Containing Silica**—This is a very interesting statistical analysis of the mortality experience of an occupational group exposed to silica compared with that of a general or standard population and an occupational group exposed to dust not containing silica. By standardizing the deaths it was found that the comparative mortality figures for all causes and all ages (20–65) were 1,000 for the standard population, 1,984 for the silica group, and 967 for the non-silica group respectively. Comparative mortality experienced in the silica group for 23 causes or cause groups, showed only 3 causes (diabetes, appendicitis, and other diseases of the digestive tract) with mortality not significantly different from that of the standard population. Very high mortality (over double that of the standard population) were noted due to pulmonary tuberculosis, other tuberculosis, chronic rheumatism, bronchitis, chronic interstitial pneumonia, other diseases of the respiratory system, and hernia.

In the non-silica occupational group mortality for influenza, pulmonary tuberculosis, bronchitis, chronic interstitial pneumonia, and other diseases of the respiratory system was higher than that of the general population.—Edgar L. Collis and G. Yule, *J. Indust. Hyg.*, XV, 6:395–417 (Nov.), 1933. L. G.

CHILD HYGIENE

MATERNAL AND CHILD WELFARE WORK IN RUSSIA

TWO recent publications [1, 2] have been received from Russia which set forth an interesting and unique program for the protection of motherhood and childhood under way in the Soviet Union. The philosophy and activities of the socialist state as related to maternity and child hygiene are clearly portrayed.

The protection of motherhood and childhood is one of the most important problems of the Commissariat of Public Health. It occupies a special place in the social policy of the Soviet State as a whole. The importance of this problem is immediately connected with the rôle and place which the working woman of the land of Soviets occupies in state construction, in social life and in industry in all its stages and forms, as one participating in all its activities with a perfect equality of rights.

The principal points which characterize the Soviet code of laws for the protection of maternity are:

1. The woman working in a factory who is engaged in physical labor is released from all work for a period of 8 weeks before and 8 weeks after her confinement, with full wages. If she is an employee or worker in a mental profession her leave is 6 weeks before and 6 weeks after her confinement.

2. A woman cannot be discharged during her pregnancy and motherhood leave. She must be reaccepted to her work after her leave.

3. The nursing mother in addition to the usual intervals of rest during work is entitled to no less than half an hour every 3½ hours of work. These periods of interruption in her work are counted as working time.

4. The pregnant or nursing mother cannot be sent on missions. No overtime work or night work is allowed for pregnant and nursing mothers. The pregnant woman has the right to receive a railway ticket or necessary information in Soviet offices out of turn.

5. In U.S.S.R. the mother is made economically independent by being insured in the State Social Insurance Organization. It is the state organization and not the working woman that pays this fee in its entirety.

. . .

The social insurance of motherhood is carried out by giving the woman help in the following cases:

1. For pregnancy and delivery
2. For the infant's feeding, for his care and for nursing him during illness
3. For free medical care

The assistance for pregnancy and motherhood is paid to those insured during the full time of their leave according to clause 132 in the measure of their full wages during this period.

4. Those insured and their wives in the case of child birth receive additional assistance granted but once for the care of the newborn. This assistance is equal to the average monthly wages for workers of the given locality. Another sum for the child's food equal to the fourth of the average monthly wages of the given locality is paid every month during 9 months beginning from the day of the child's birth.

PRESCHOOL INSTITUTIONS

Preschool education in Russia was one of the weakest links in public education before the Revolution. In 1913 there were only about 200 institutions for it in the whole country.

Immediately after the Revolution, a rapid growth of kindergartens and other preschool institutions set in; they numbered thousands even in the first years of Soviet power, which were those of civil war. But the growth of national economy in town and country, the entering upon the reconstructive period called for a still greater extension of the preschool net as well as of that of creches.

. . .

The growth of preschool education which the first Five-Year Plan had in view has not only been achieved, but has been carried out in an eight- or nine-fold measure—thus, by the end of the first Five-Year Plan (1932), 500,000 children were to have been enrolled in the R.S.F.S.R., whereas in reality their number exceeded 4 millions.

By the end of the second Five-Year Plan period in 1937, the number of children benefiting by the service of educational in-

stitutions must reach in the R.S.F.S.R. a figure of 10.5 millions.

In progressive districts of the Union an enrollment of all preschool children has nearly been completed. In Moscow even by the end of the year 1932 preschool institutions had absorbed 90 per cent of all the children of workers, and in the Ural industrial centers—75 per cent.

Among the public organizations rendering help in the work of education and of improvement of sanitary conditions for preschool children a prominent place has been taken by the preschool coöperation, which has considerably grown of late. Many millions of parents have been drawn into the work of preschool education, especially mothers, who take this task to heart and consider it to be of the greatest importance. It is to public assistance and support that the rapid growth of preschool education is due. In the year 1932 upwards of 70,000 kindergarten teachers were trained at courses of short duration, and in 1933 upwards of 80,000 will be trained in the R.S.F.S.R. alone. . . .

Preschool institutions are of varied types including:

(a) The kindergartens without boarders

(b) The kindergartens with boarding section

(c) The children's rooms attached to clubs

(d) The children's rooms attached to the schools for adults (for the mothers who are studying)

(e) Children's playgrounds out of town and in town: in courtyards, on boulevards, in green squares, in parks

(f) Children's homes for orphan preschool children. . . .

The time which the child spends in the preschool institution varies according to the nature of the occupation of its parents, but as a rule it is at least 7–8 hours and sometimes 10–12 hours a day. This is especially true as regards kindergartens attached to enterprises where women are mainly employed. A large number of dormitories are now attached to the kindergartens. The child is taken care of both during the day and at night time. In Moscow in 1932, of 65,000 children in kindergartens 19,000 were boarders. Their number more than doubled in the course of 6 months. . . .

The great tasks with which the country is confronted in the second Five-Year Plan has greatly enhanced the political importance of the further development of preschool education.

The rapid growth of the network of preschool institutions during the last few years, the attention paid to them by proletarian organizations, the mobilization of local resources of the country, of the population itself for the construction of kindergartens and playgrounds, enable us within the next few years to realize for the first time in the world the task of introducing universal preschool education in the land of the Soviets.

By the end of the second Five-Year Plan all children from 3 to 7 will have been embraced by preschool education.

We have already begun to tackle this task.

In 1932, 85,000 new preschool teachers were trained. The stationary pedagogical school alone cannot in the near future cope with this task. The main work will have to be done by means of short-term courses which are organized all over the country (3, 5 and 8-months courses). However, the stationary institutions will gradually increase in number, until they will fully supplant the short-term courses.

The main task at the present time is to select the best of the students after their completion of the short-term courses and give them a thorough training. The main task will be to show them the work of model kindergartens, to acquaint them with the achievements of the more advanced and successful ones. Therefore a network of model preschool institutions and district pedagogical cabinets is being set up. Each district, as a rule, has not only a preschool inspector but also a "methodist" (specialist) introducing the more up-to-date methods. Many new advance courses for preschool workers are set up, as well as pedagogical consultative departments for conducting work with the parents.

Special stress is being now laid on the quality of the work. This is the surest method of guaranteeing continued successes.

The quantitative increase in and the qualitative improvement of preschool institutions are closely bound up with each other and together they constitute the great task of bringing up the children of the Soviet Union in the communist spirit.

The broad masses of the population and the social organizations of the U.S.S.R. are all actively participating in creating ever more and more kindergartens, in their qualitative improvement, in bringing about universal preschool education.

REFERENCES

1. *Protection of Motherhood and Childhood in the Soviet Union*, by Dr. E. Conus, People's Commissariat of Health of the R.S.F.S.R., State Research Institute for the Protection of Motherhood and Infancy, 1933.

2. *The School in the U. S. S. R.*, Vol. I–II, 1933 *of V. O. K. S.*, Bi-Monthly Periodical Published by The Soviet Union Society for Cultural Relations with Foreign Countries.

EDUCATION AND PUBLICITY*

The Audit

SUPPLEMENTARY to the main elements of a social educational publicity program should be a merciless personal audit of the finished project. After the returns are all in—when the last meeting has been held, the final distribution of printed matter made, and all activities of the immediate effort have been recorded as history—is the time to put yourself and your methods through the third degree.

Accept with becoming modesty the compliments of friends and well wishers. Then seek your chronic kicker and solicit him to unburden himself. He may be inaccurate and will surely be unfair, but out of it you may get some leads for further examination in seeking how better to plan and administer the next time.—Elements of a Social Publicity Program. *Proceedings of National Conference of Social Work, 1920.*

When the Health Officer Is "Overpaid"—Some people, according to *Health News,* New York State Dept. of Health, argue that health officers do too little to earn their salaries:

> . . . The trouble is that local officials, usually town supervisors, who start these movements have no idea what their health officers are doing. This is largely the fault of the health officers themselves. If every health officer would regularly make to his local officials an *interesting and readable* report and publish the report, or an *interesting* summary in a local paper, it would do much to put an end to such movements.

"Health Education in an American City"—This is not a review of the new book by Louise Franklin Bache. That function will be fulfilled in due season in the regular book review section of the *Journal.* This is merely an appreciation of what the book is, and an attempt at describing what the book is not.

We have long needed a book of this type—a review of what an effective health department actually has done, directly and in coöperation with other local agencies. We wish that the book could have been larger, so as to cover in equal detail the individual health education activities of the various coöperating health and other agencies in Syracuse. There is a place on the bookshelf for that sort of book.

This book is not a manual on health education, but it has some of the valuable characteristics of such a volume. It tells of activities carried on and materials prepared and used. In recording all this nearly every page gives some glimpse of why something was done, why it seemed to be successful, why it failed or was unsatisfactory.

How could so much be done in 5 years, so much of such a degree of excellence? The answer is easy. There was the sympathetic sponsorship of the Milbank Fund and the State Charities Aid Association; an enlightened health department policy,

* Please address questions, samples of printed matter, criticism of anything which appears herein, etc., to Evart G. Routzahn, 130 East 22d St., New York, N. Y.

and an understanding health officer; a generous, but not lavish, budget; an unusually equipped director of health education, and an exceptional team of specialists on the department staff, and the staff of the local public health association. Has any other city had such a team working under such favorable conditions?

In *A City Set On A Hill,* Professor Winslow tells how important is the adequately prepared director of health education. The yearly budget varied from $11,477 to $13,378, or as stated by Professor Winslow,

> 5.4 cents per capita, which is to be compared with a standard expenditure of 4.0–6.5 cents.

The largest item on the bureau budget was the salary of the bureau director. That was as it should be. The book bears unconscious testimony to the economy in paying for personal ability. For example, the active enlistment of literally hundreds in various projects was largely due to the resourcefulness and energy of the director.

Here, as in *A City Set On A Hill,* we note the lack of a program of health education, such as was discussed in the *Journal,* May and June, 1929, and, as was stated briefly in this department a month ago:

> A program or a plan for health education, as we see it, is not the planning of the details of a particular project or event. Rather we are thinking of a plan or program for a year or other extended period. It is the selection of the objectives and the chief audiences and mediums mapped out in relation to the needs of the community and the resources of the health agency, or the group of health agencies.

There were programs, in the plural, the stressing of special themes, much planning. But there was too little time in Syracuse for the development of an underlying, inclusive program or the formulation of a philosophy of health education out of which such a program would have emerged. One might ask even if too much was undertaken, and if the supervisory groups thought of health education largely as a succession of methods and materials to be manipulated with energy and varied skills.

Every public health worker concerned with the organization of health education will wish to read *Health Education in an American City,* by Louise Franklin Bache. Published for the Milbank Memorial Fund by Doubleday, Doran and Company, New York, N. Y. *$2.00.* For sale by the A.P.H.A. Book Service.

Czechoslovak Republic Wishes to Hear from You—We hope that many readers will respond to this and other requests from outside of United States and Canada which we publish now and then. Please send samples of various types of health education and publicity.

> We take very much interest in the field of public health education and would be glad if it is possible to send us some of the new issues on health education. The member of our staff, Mrs. Dr. Klimova-Fugnerova has been studying health education during the year 1932 and profited greatly by it. We try to do our best in this field even in these unfavorable conditions, and think the material of U.S.A. may be of great use to us.

From Dr. L. Votava, Chief of the Health Education Department, State Institute of Public Hygiene of the Czechoslovak Republic, Praha XII, Korunni Tr. 162.

"Propaganda in an Economy Programme"—Under this heading are reported addresses before the annual meeting of the National Baby Week Council. Several paragraphs seem to be equally significant in Canada, the United States, and elsewhere:

> Reduced means are teaching us at least one valuable lesson—the lesson that expensive propaganda is not always the best propaganda. This should be a cheering reflection for many a committee whose depleted funds, so far from meeting a publicity bill, will scarcely cover running expenses.
>
> . . . The critical financial situation was

itself a vital reason why health propaganda should not be relaxed. It was at present the duty of propagandists to safeguard from reduction the relatively insignificant amount at present devoted to public health work. This could be done by creating a strong public opinion on the necessity for health work.

. . . No forms of propaganda bore more immediate fruit than public health education. Speaking generally, the health services of this country were highly organized. The publicity problem of the day was to persuade the public to take full advantage of those services.

. . . It was perhaps not altogether unfortunate that, faced with the necessity of maintaining good publicity with very little money, we were forced to examine the old methods, to decide which had proved themselves effective, and which had become obsolete.

. . . I have found poster methods too expensive, but there are plenty of other methods of making the work known to the public. If you have a Baby Week, do it on a big scale, with a procession right through the town! If you are opening a clinic, treat it as an important event, and invite all the prominent people in the town to be present.—*Mother and Child,* 5 Tavistock Square, London, W. C. 1. April, 1933. *9d.*

Health Education in Arizona—The State Board of Health has announced that

A Division of Health Education, state-wide in its scope, has been organized for the purpose of carrying out a comprehensive program of visual education in public and personal health matters. Coöperation of several agencies, including the U. S. Public Health Service, The Rockefeller Foundation, the University of Arizona, Extension Division, and the Metroolitan Life Insurance Company, has been secured for this state-wide program. The program is to be carried out by the use of motion pictures which will be exhibited in schools, before Parent and Teachers Associations, woman's clubs and other organizations or agencies interested in promotion of public health and welfare throughout the state.

The department has obtained complete motion picture equipment for this project, including projection machine and screen which may be used wherever electricity is available. Arrangements will be made to exhibit these motion pictures in any school in the state or before any organization interested in the subjects to which they pertain upon written request.

"In Conference"—"How Effective Is Health Education?" will be presented at the annual meeting of the National Tuberculosis Association, Cincinnati, May 16. Speakers: Mrs. Ruth Heavenridge, Indianapolis; Dr. John Sundwall, Ann Arbor; Mary P. Connolly, Detroit.

The Division on Educational Publicity, under the chairmanship of E. C. Lindeman, and Social Work Publicity Council will hold a number of sessions in connection with the annual meeting of National Conference of Social Work, Kansas City, May 20–26, 1934.

Dr. H. E. Kleinschmidt will conduct a publicity clinic at the biennial meeting of the National Organization for Public Health Nursing, Washington, April 25.

Mary Swain Routzahn led a round table on "Publicity and Annual Reports" at a regional conference of American Assn. of Hospital Social Workers.

Palestine Will Welcome Your Material—Reprints, copies of journals, and other printed material would be welcomed by editors of—

The health, medical and hygiene journals issued in Palestine.

The Jewish National and University Library has a large medical department and is also interested in receiving health, hygiene, and medical periodicals. This department is of great service to the physicians and medical scientists of the country.

Kindly address to K. L. Meltzer, Hebrew University, P.O.B. 340, Jerusalem, Palestine.

We hope that this and similar requests will be answered from the many countries represented among our readers.

Information Wanted—What have you or what would you suggest?

. . . any material on Health Education. I am interested in health programs in general,

but particularly in health measures, programs, outlines, etc., in the outpatient departments—which may include various clinics.—Edna Mae Barrios, R.N., Vanderbilt University, Nashville, Tenn.

. . . samples of literature suitable for me to use in my work as dental hygienist in a public school.—Ruth Neighly, H. W. Gillett Dental Clinic, Glen Cove, N. Y.

Hygeia for March, 1934—*Hygeia*, American Medical Assn., 525 No. Dearborn St., Chicago, Ill. (*25 cents*), contains:

Plumbing and health (based on Chicago outbreak); Facts and fallacies of cosmetic surgery; Does your nose know? Full speed ahead kills (modern rush); The child who stutters; What shall a man believe? (advertising); Cancer—its status today; Massage; Keeping the underweight child in school, Committee acceptance of whole wheat flours; Building for posture; Cold feet; Sex in middle and advanced life; Helping baby to grow up; Training for golf and competitive swimming; Modern voodooism; What happens when you move; "School and Health," with organizing for good team work, how home and school can work together, new health books for teachers and pupils; New books on health; Questions and answers.

"Yellow Jack" in New York City—The heroic tale of the struggle of man versus "yellow jack" is told dramatically in a moving and significant play by Sidney Howard. It is based on a chapter of Paul de Kruif's *Microbe Hunters*, and is now being shown at the Martin Beck Theatre, in New York.

Yellow fever epidemics have inspired other writers before. The story of "The Flying Dutchman," the subject of an opera by Wagner, tells of a ship stricken with this scourge. A description of an outbreak of yellow fever among the crew of a ship is also given in Coleridge's *Ancient Mariner*. But all this was before Walter Reed and his coworkers, Drs. Carroll, Lazier, and Agramonte, as a result of their investigations carried on in Cuba in 1900–1902, proved that yellow fever is transmitted by the bite of infected mosquitoes, and in no other way; and long before the second chapter of yellow fever began in 1927 with the discovery by Stokes and his coworkers that Asiatic monkeys were susceptible to yellow fever and might be used as experimental animals; and even longer before the recent discovery of a special vaccine.

Sidney Howard begins his play at the end, presumably with the idea in mind that the modern knowledge of the cause of yellow fever will give new meaning to this dramatic triumph of man over yellow jack. But his intermissionless play deals mainly with Reed and those other brave men who volunteered to face the dreaded experiment of being bitten by infected mosquitoes.

It is worth seeing, this play on the conquest of science and the willingness of men to give their lives to the dreaded yellow jack, in the cause of humanity. It is a play of great importance, especially for social and public health workers (notwithstanding that at least one of Howard's buck privates volunteering for the experiment verges on caricature). You would not want to miss it.—Savel Zimand.

Dates Ahead—Through the year national and local events offer opportunities for the department, the association or the council to take the lead, to participate, or to be recognized. Doubtless some overlapping of dates and of interests will be settled in individual communities.

"Negro Health Week" is about over as this issue of the *Journal* appears.

April—"Early Diagnosis Campaign—Health Recovery Campaign" sponsored by tuberculosis associations.

April 28–May 5—"Youth Week" (formerly "Boys' Week"). Address: National Youth Week Committee, 211 W. Wacker Drive, Chicago, Ill. Tuesday, May 1, is "Health Day."

May 1—"May Day" or "Child Health Day." Address: American Child Health Assn., 50 West 50th St., New York, N. Y.
May 13—"Mothers' Day." Address: Maternity Center Assn., 1 East 57th St., New York, N. Y.
May 7—"Jubilee of Organized Camping." Address: Community Chests and Councils, Graybar Bldg., New York, N. Y. An opportunity for local groups to stress the values of organized camping.

"The Dominion is Preparing for Celebration of Several Important Anniversaries" reads a headline over a mention of commemorations of 100 to 400 year old events. We hope to hear that Canadian health workers are planning to show health progress and changes in health conditions in connection with the celebrations.

Early Diagnosis in 1934 — The February *Journal* had several pages about this campaign, sponsored by tuberculosis associations, and offering a significant opportunity for all types of health agencies to participate in making a real impression upon the community.

A usable range of printed matter, other help and plan suggestions have been prepared.

Get in touch with local, state or national tuberculosis associations.

"Mother's Day," May 13, 1934—This year "a planned economy of mother's lives" is proposed as the objective of Mother's Day celebrations. This is achieved by means of

. . . a country-wide effort to appraise the maternal facilities of each community. This is to be done by women's clubs, and men's clubs coöperating with local obstetricians, hospital executives, and medical societies. Local surveys are to be made using a blank appraisal form which the Association provides free. After such an appraisal, it will be seen more clearly just what is needed to effect improvement.

Every local club or group sending in a form will receive, without charge, a copy of the *Maternity Handbook*, by Anne A. Stevens. The three clubs submitting the best appraisals will get a complete maternity display equipment, which may be used to teach maternity hygiene to mothers. The contest closes May 1, just in time so announcement of winners may be made by Mother's Day.

For men's clubs there is provided a suggested program for a meeting to be held the week just before Mother's Day. Publicity material in the form of ideas and suggestions for use with local newspapers and radio stations, will be sent to any local group on request.

Kiwanis International has sent to its 2,600 clubs a statement about Mother's Day. Rotary and Lions Internationals are exected to do likewise.

Address Maternity Center Assn., 1 East 57th St., New York, N. Y. for full information. A new 4-color poster, 14 x 22 inches, is sold at *10 cents*.

Health Education in the Schools—The following references appeared in *Library Index*, National Health Council, 50 West 50th St., New York, N. Y.

Mrs. Barclay learns about diphtheria prevention, by Marie Dandridge. *Public Health Nursing* (New York City) 26:39–40, Jan., 1934.

Teaching food appreciation, by I. A. Mercer. *Journal of Health and Physical Education* (Ann Arbor, Mich.) 5:26–27, Jan., 1934.

The nurse and the classroom health program. *Public Health Nursing* (New York City) 26:50–51, Jan., 1934. The second topic in the Study program for school nurses.

The teaching of health education in elementary schools, by W. W. Patty, Ph.D. *Journal of Health and Physical Education* (Ann Arbor, Mich.) 5:3–7, Jan., 1934.

Lay dental health education, by G. H. Wandel, D.D.S. *Journal of the American Dental Association* (Chicago) 21:170–80, Jan., 1934.

Psychological by-products of health education, by Ruth Brickner. *Child Study* (New York City) 11:135–37, Feb., 1934.

Well balanced health training, by H. N. Bundesen. *Child Study* (New York City) 11:138–39, Feb., 1934.

Health education in the junior high schools, by E. K. Morrison. *Public Health Nursing* (New York City) 26:94–96, Feb., 1934.

When home and school coöperate, by A. M. Phelan. *Child Study* (New York City) 11:141–43, Feb., 1934.

Adult attitudes and health education, by B. B. Robinson. *Child Study* (New York City) 11:139–41, Feb., 1934.

What the superintendent expects of the health and physical education teacher, by N. G. Engelhardt. *Journal of Health and Physical Education* (Ann Arbor) 5:3–6, 56, Feb., 1934.

Outcomes of health education: I. Knowledge. II. Habits and skills. III. Attitudes, by W. W. Patty, Ph.D. *Journal of Health and Physical Education* (Ann Arbor) 5:34–37, 62, Feb., 1934.

Correlation between physical and health education and the school medical inspection service, by W. S. Cornell, M.D. *Mind and Body* (New Ulm, Minn.) 40:200–5, Dec.-Jan., 1933–1934.

School and health, a department conducted by J. Mace Andress, Ph.D. *Hygeia* (Chicago) 12:167, Feb., 1934. Hitting the nail on the head—School health days that count.

Solving health educational problems. *Hygeia (Chicago)* 12:167–70, Feb., 1934. Schoolroom conditions and practical health education programs, by R. J. Schmoyer.—Organizing objectives in safety education, by H. J. Stack.—Health education aims for rural schools, by R. E. Grout.

Organization for health instruction in public schools, by J. F. Williams and C. L. Brownell. *Teachers College Record* (New York City) 35:269–70, Jan., 1934.

Planning and exhibit, by Pearl Turner. *Public Health,* Michigan Dept. of Health (Lansing) 22:29–32, Feb., 1934. The fourth of a series of articles on visual education.

Education and Prevention in New Jersey—Governor A. Harry Moore in his annual message to the 1934 Legislature:

The one important lesson in this field to be learned from the experiences of the last 4 years, it seems to me, is the necessity for some shifting of our emphasis in the attack upon this whole health and welfare problem. For many years past we have used the greater part of our energy and most of our expenditures in treatment and attempting to correct health and dependency conditions which ought never to have occurred, and we have given entirely too little attention to the preventive side of our public health work. Our institutional population has shown a steady and continued growth year after year, and, notwithstanding the extension of existing institutions and the construction of new ones, practically every state and county institution for the custodial care of public wards is crowded to the doors and waiting lists continue to grow.

We must attack this problem at its source and this means the substitution of prevention to the greatest possible extent for care and cure. This also means a more determined attack upon disease, insanitation and unwholesome social conditions, more and better public health work, more and better clinics, more and better probation and parole work, more general health education, and, I trust, fewer persons in public institutions maintained at large annual cost when the greatest possible economy is practised. In the proportion that more funds are devoted wisely to preventive health work we may expect to save an increased amount at the custodial end.

RADIO

Next month we would like to pass over Illinois, Connecticut, and Baltimore, and give some glimpses of broadcasting by other state and local groups. We now receive mimeographed radio talks only from the three named above.

Baltimore Health Department:

Highlights in public health, temper tantrums, the lowly germ, rabbit fever, what is indigestion? check your health, eczema, keeping well in 1934, the longest war in history (tuberculosis), watch your weight, measles is here, baby teeth may need filling too, Mrs. Barclay learns about diphtheria prevention (dialogue).

Connecticut State Department of Health, Hartford:

New mental hazards, have you proof that you were born? the community X-rays its children, the public health nurse and tuberculosis program, odors and tastes in water.

Illinois State Department of Health, Springfield:

Diet and head colds in children, more about common colds, bone button infection in industry, the hide and hair industrial menace (anthrax), lead poisoning in industry and its prevention, phases of physical fitness in industry today, health heroes and public health, Dr. Banting and public health aids, Edward Jenner and vaccination, pure food laws and public health, what noise may do to public health, the challenge of pneumonia, anatomy and cell structure exhibits, one hundred years of Pasteur, economics of clean streams and sanitation, the woman who was ministering angel (Florence Nightingale), the story of inoculation, sewage treatment—an essential to

modern civilization, from sorcery to science, when healers were gods, one man's work in life saving (Dr. Park), accidental discovery in medicine and the part played by the layman.

Health plays are broadcast Mondays at 3:15 p.m., E.S.T., by New York State Dept. of Health over station WGY.

SOME TITLES

Do these suggest timely topics, or new slants on old material?

"Smallpox Visits You in the Person of Miss X"; "Upsetting Some Popular Beliefs Concerning Sleep"—Iowa State Dept. of Health, Des Moines.

"To Recent Arrivals" (to the newborn baby about registration); "Like a Forest Fire" ("catching" diseases)—Maryland State Dept. of Health. Baltimore.

HONORABLE MENTION

To Health Dept., Palo Alto, Calif.: for table of contents, an organization chart, an "Education and Publicity" section, and a diagram of city budget appropriations showing amount, percentage and per capita (health of course being the lowest).

MAGAZINE ARTICLES

"The Common Cold," by C. H. Gellenthien, M.D. *Kiwanis Magazine*, 520 N. Michigan Ave., Chicago, Ill. March, 1934. *15 cents.*

"Disease Germs Often Swallowed With Our Meals" was a full-page, half pictures, half text, in *American Weekly*. Feb. 4, 1934. This is the Sunday magazine used by Hearst newspapers, the most widely circulated periodical in the United States. The article emphasized the message of the Committee for the Study and Promotion of the Sanitary Dispensing of Foods and Drinks.

"How Much Do You Weigh?" by L. I. Dublin. *American Magazine*, Springfield, Ohio. March, 1934. *25 cents.* If over or under, "he tells what bearing that answer has on your probable length of life."

NEW

Also new to us is *Arizona Public Health News*, State Board of Health, Phoenix. The Feb., 1934, issue was the 96th.

REPORTING

"Inventory for 1933," is a reporting of social hygiene work by state and local departments, associations and committees, and the United States governmental program for control of the venereal diseases, with a directory. 75 pages. *Journal of Social Hygiene*, 50 West 50th St., New York, N. Y. *35 cents.*

Again the annual report of the health officer, Middletown, N. Y., "looks interesting." The 15 mimeographed pages are like no other mimeographed production we have seen. It is something to send for by the department or other health agency wishing to get its annual report read by a goodly proportion of the so-called "general public" and at a low cost. Here are two quotations:

It is difficult for people to understand why present methods of communicable disease control differ so widely from those in vogue short years ago. Does it seem strange to you that we do not close schools during outbreaks and that we placard fewer and fewer of these diseases?

We are not proud of our department's tuberculosis program for 1933. The control of tuberculosis is largely a nursing problem. It is obvious, however, that one nurse doing generalized public health in a city of 18,000 cannot devote the necessary time to it. With extra nursing service starting December 7, 1933, thanks to the C.W.A., we hope to do more intensive follow-up.

EDUCATION AND REFERENCE

"The Family Food Supply: What to Buy and Why." 23 pages. Metropolitan Life Insurance Co. *Free.*

"The Nature of Bacteria," by C. E.

Turner and Ellen L. Lytle. A suggested teaching plan based upon an experimental teaching project. 38 pages. Metropolitan Life Insurance Co. *Free.*

"Diets at Four Levels of Nutritive Content and Cost," by Stiebling and Ward. 59 pages. "Presents diets at four levels and includes information on certain aspects of food purchasing." Supt. of Documents, Washington, D. C. *5 cents.* Probably *free* upon request to Bureau of Home Economics, Dept. of Agriculture, Washington, D. C.

"The Effect of Milk on Sleep" is a memorandum summarizing studies on this subject. National Dairy Council, Chicago. *Free.*

"The Psychology of Progressive Deafness," by G. Berry, M.D. Reprint from *Journal,* A.M.A. American Medical Assn., 535 N. Dearborn St., Chicago, Ill. 12 pages. *10 cents;* 10 copies, *50 cents;* lower rates for more. Send a copy to the chief editorial writer of the newspaper having the most thoughtful editorial page.

"The Economic Aspects of Medical Care," is a revised list of reading references. Julius Rosenwald Fund, 4901 Ellis Ave., Chicago, Ill. *Free.*

"English Workmen Pay Their Hospital Bills," by M. M. Davis. Reprint from *Modern Hospital.* Julius Rosenwald Fund. *Free.*

"A Picture-Book About the Costs of Medical Care." 16 pages, largely picture diagrams. Julius Rosenwald Fund. *Free.*

Reprints from *Public Health Nursing,* 50 West 50th St., New York, N. Y. *10 cents* each:

"Planning for 1934: Supervision." 2 pages.

"Treatments in School." 2 pages.

"The Rôle of the Public Health Nurse in Communicable Disease Control." 9 pages.

The following reprints from *Sight-Saving Review* are offered by Natl. Society for the Prevention of Blindness, 50 West 50th St., New York, N. Y.:

"Home Treatment of the Eyes," by W. L. Benedict, M.D., 5 pages. *10 cents.*

"Routine Wassermann Test for All Expectant Mothers," by E. L. Keyes, M.D. 4 pages. *5 cents.*

"The Eyes in Infancy and Childhood," by E. L. Coolidge, M.D. 3 pages. *5 cents.*

"Why Wear Glasses," by P. A. Halper, M.D. 6 pages. *10 cents.*

"Conserving the Sight of Myopic Children," by A. L. Brown, M.D. 4 pages. *5 cents.*

"Eyesight in Mental and Physical Development," by A. R. Wilkinson, M.D. 7 pages. *10 cents.*

"Contact Glasses," by W. S. Knighton, M.D. 6 pages. *10 cents.*

A report of the Committee on the (proposed) American Museum of Hygiene appears in the A.P.H.A. *Year Book,* 1933–1934, page 54.

"Questionnaire Outline for Discussion Course on Welfare Resources." A study outline prepared by Assn. of Junior Leagues of America and distributed by Community Chests and Councils, Inc., 1810 Graybar Bldg., New York, N. Y. 19 pages. Questions as to conditions, possibilities, standards—all in their local application. "Health Problems," 4 pages, covers state and local boards of health, board of education, hospitals, clinics, dental clinics, public health nursing—but not other types of voluntary health work. *Free.*

"Publications and Memoranda," a new list of helps on publicity issued by Social Work Publicity Council, 130 East 22d St., New York, N. Y. Includes health education and helps for those doing health education.

The A.P.H.A. *Year Book,* 1933–1934, may well be studied for the declarations and various reports as desirable background material.

Well nigh indispensable is *Library Index,* edited by National Health Library of National Health Council, 50 West 50th St., New York, N. Y., at

$2.50 for the weekly issues. Makes available much of the most useful of current periodical references touching nearly the whole range of public health topics.

THE INCOMING TRAY

The "Home of the North Carolina State Department of Health" is pictured on the cover page of *Health Bulletin* of the State Board of Health, with this caption:

> Readers of *The Bulletin* are again invited to visit the offices of the State Board of Health at any time while in Raleigh. School teachers accompanying children to Raleigh should include the Health Department in their list of places to be visited.

Birmingham's Health, Jefferson County Board of Health, Birmingham, Ala., Feb., 1934, devotes most of its space with effective text and diagrams, to emphasizing this statement which appears on the cover:

> Of all the cities in America, large and small, rich and poor, North and South, only two have destroyed their public health organizations as has Birmingham.

In "Public Health Education," D. V. Curry, M.D., describes his effective use, as medical officer of health, St. Catharines, Ont., of displays in empty stores. *Health Officers' World*, 2912 N. Hackett Ave., Milwaukee, Wis. *20 cents.*

Illinois Health Messenger, Illinois State Dept. of Health, Springfield, appears for 1933 in a cloth bound volume with a rather full index.

The *Rochester Democrat and Chronicle* gave a good full-page to the Monroe County and Health Assn., Rochester, headed "Health Seals Spread Christmas Cheer." A variety of pictures occupied much of the page which, happily, cut down the amount of text.

The *New York Times*, Feb. 25, 1934, carried a 3-column wide picture of a healthmobile used by Los Angeles. "Bringing Health to the Back Country . . . Covers the Remote Sections of the 1,094 Square Miles of the School District" . . . said the caption.

"Multigraphed and bound in the Milwaukee Health Department" was an attractive "Manual of Procedure and Guide for Coöperating Committees in Organizing Preschool Clinics." Excellent use has been made of the display type available for the multigraph; 6 by 9 inches; 16 leaves, plus stiff cover with a pleasing marbled finish; blank pages for "Notes" opposite every text page. If you have a multigraph you will wish to see this example of publication possibilities. *5 cents.*

"Health and Baby Weeks in Ceylon," by J. H. DeSaram, in *Mother and Child*, 5 Tavistock Square, London, W.C.I. (Oct., 1933, *9d.*), reports that

> Health and Baby Weeks are now recognized both by medical officers of health and local authorities in Ceylon as effective means of educating the people in health matters.
>
> The chief method adopted for interesting the public in this week at Dondra was by word of mouth through the schools and headmen, but the traditional method of the beating of the tom-tom and the distribution of posters and hand-bills was also employed. In connection with the clean-up day which preceded the demonstration, a special leaflet was issued. This drew the reader's attention to ten of the main health habits. A novel competition introduced at the Dondra exhibition consisted of a headman's test in elementary health knowledge.

We feel that someone should apologize for the amount of space in this department taken up by long, cumbersome titles of health agencies. And the newest of organizations has the longest and the most formidable of names! "There should be a law!" Really such names do handicap health organizations and limit their speaking and writing use.

BOOKS AND REPORTS

The Dynamics of Therapy in a Controlled Relationship — *By Jessie Taft. New York: Macmillan,* 1933. 296 pp. Price, $2.50.

The therapeutic value for children resulting from the relationship between therapist and patient deserves the consideration of those interested in the behavior of children. This book gives the records of two such situations: (1) "An Experiment in a Therapeutically Limited Relationship with a Seven-Year-Old Girl," reprinted from the *Psychoanalytic Review;* (2) "Thirty-one Contacts With a Seven-Year-Old Boy as Preparation for Placement in a Foster Home."

In these accounts of the 16 and 31 hours spent, respectively, with these children over a period of weeks, the author gives in detail an accurate account picture of the relationship between herself and the patients. Her account of each child's reaction is not a description of what happened, but rather a verbal expression of the dynamics of the child's personality. The influence of the transference or analytic situation becomes apparent.

There is also a chapter on "The Time Element in Therapy," which is of value particularly to those who in clinic have to make the most of each hour with a patient. In the conclusion entitled "The Forces That Make for Therapy," are set forth some ideas regarding the reasons for life's failures and the sources and means of relationship therapy. The author adheres to many ideas given by Otto Rank.

The book has merit in weighing the possibilities of offering psychotherapy to individuals, either by social case work or by physicians. Dr. Taft does not jump to any preconceived conclusions but honestly records what she noted. The book is well worth reading.

ELIZABETH I. ADAMSON

Food-Borne Infections and Intoxications—*By Fred Wilbur Tanner. Champaign, Ill.: Twin City Printing Co.,* 1933. 450 pp. Price, $5.50.

The author treats of a subject which has been much before the public for some years. He believes that the acceptance of ptomaines as causes of illnesses has retarded work along sound lines and calls attention to the fact that heat-stable gastrointestinal irritants formed by members of the staphylococcus and Salmonella groups furnish better explanations for food poisoning.

There is an introduction treating of the subject in general, followed by one on the hygiene of food, cooking, handling, etc. We are glad to note that he lays stress on the medical examination of food handlers. Insect carriers and other vectors are considered. The special types of infections are taken up under the heads of the groups of organisms which cause them. Extensive tables and accounts of a large number of reported outbreaks are given. The book contains a great amount of valuable material which will be useful for reference.

The printing and make-up are good.

MAZŸCK P. RAVENEL

Alcohol. Its Effects on Man—*By Haven Emerson, M.D. New York: Appleton-Century,* 1934. 114 pp. Price, $1.00.

This is an excellent presentation, written for school teachers, high school and college students, of the subject em-

braced in the title. The book has been practically summarized in the 15 points enumerated in the preface concerning which there is agreement among those qualified to judge. The subject matter of the book is largely made up of matter going into more detail to prove the points mentioned. There is one inconsistency which may be mentioned. On page 105, the author quotes Sir Arthur Newsholme, well known as an extreme dry, as showing that 1 per cent of the adult males in England each year get drunk, in the official police sense, while 1 in 200 is legally convicted of public drunkenness. He goes on to say that crimes of physical violence with or without drunkenness are greater where the per capita alcohol consumption is high. The report of Baron Trenchard for 1932, just issued, shows that there were only 21 murders during that year in London, and up to approximately the middle of February, 1934, not a single murder has occurred.

The book is well written and contains many valuable facts. It ends by giving a list of 12 authoritative sources of information which have been consulted. Unfortunately, it has a jacket with the usual amount of blurb to which publishers seem addicted.

MAZŸCK P. RAVENEL

Diet and Personality—*By L. Jean Bogert, Ph.D. New York: Macmillan,* 1934. 223 pp. Price, $2.00.

The title of this book will undoubtedly attract the attention of the "average man and woman" for whom it is admittedly written. The same average man and woman will find it easy, interesting reading, and concrete information may be obtained, but one seriously doubts the final effect upon personality.

An introduction by Dr. Mendel points out the "food conscious" attitude of the American public and recommends the fitting of diet to type.

The book is made up of 15 chapters with the first 3 devoted respectively to the diet problem of the slender person, the stocky person and the person of medium build, which classification seems all inclusive. Then follow rather generalized discussions of such enemies to satisfactory living as nervous strain, city perils, lack of exercise, improper posture, indigestion, constipation, underweight. Good and bad health habits are listed and there are specific "Do's" and "Don'ts." Throughout these chapters, there are many references to the endocrine rôle in body types and the possibilities of diet in resulting conditions. A chapter on Reducing Diets suggests menus and foods suitable for the reducing-conscious reader.

The book is written in a popular, rather breezy style. It contains much informative material regarding general living conditions and health habits and diet.

It is printed on good paper in a type that will make it good reading for the general public.

ANNA DEAN DULANEY

Chronic Illness in New York City—*By Mary C. Jarrett. Foreword by Dr. Ernst P. Boas. 1933. Published for the Welfare Council of New York City by the Columbia University Press. 2 vols.—Vol. 1, Problems of Chronic Illness,* 258 pp.; *Vol. 2, The Care of the Chronic Sick by the Different Types of Voluntary Agencies,* 287 pp. Price for 2 volumes, $5.00.

These two volumes represent, as Dr. Boas writes in the Foreword, "the first carefully considered review and interpretation of the many aspects of the problem of chronic disease, grounded on an adequate factual basis." The study describes critically the findings of a survey of the chronically ill and the facilities for their care in New York City; and suggests "a plan for an

orderly advance toward the prevention and care of chronic illness."

Miss Jarrett's work is a challenge to public health authorities. For, as Dr. Boas states, while the public health program has, during the last 50 years, gradually broadened its scope, "the social significance of chronic illnesses, which today are the chief causes of invalidity and death, have been largely ignored." This, notwithstanding the fact that for many years there has been an increasing demand for improvement of the chronic sick on the part of organized groups, physicians, nurses, and social workers. This study is best evidence of this demand. But so far only a beginning has been made in a few places.

To awaken the community to its responsibilities on this problem and to furnish accurate information in this field, the Research Committee of the Welfare Council of New York City has performed the very valuable service of carrying on a census of chronic illness in New York City, on which data Miss Jarrett based the report.

The census of the Welfare Council included all chronically ill persons under the care of medical and social agencies in New York City. Institutional agencies reported 56 per cent, and non-institutional agencies 44 per cent of the whole number. Nearly 21,000 cases were recorded, yielding a ratio of the dependent chronically ill, exclusive of those suffering from tuberculosis and mental diseases, to the general population of 1 in 310. It is estimated that this represents only one-third of the chronically ill in the entire city. In other words, approximately about 1 per cent of the population is disabled by chronic diseases.

The two most common misconceptions concerning chronic illness are, first, that it is always incurable; and second, that it affects chiefly the aged. Miss Jarrett's study points out that the outlook for recovery from illness was favorable in one-fourth of the children and in one-tenth of the adults under 60 years of age. Regarding the second misconception, her study shows that nearly half of the chronically ill persons in the census were under 40 years of age; about one-third were under 16, chiefly children with orthopedic disorders, and nearly one-fourth of these children were under the age of 6; and only one-fifth of the whole number were over the age of 70. Moreover, the majority of patients were ambulant, only 30 per cent of the adults and 15 per cent of the children being confined to bed or to wheelchairs. Thus "chronic disease affects persons of all ages, and may occur at any time from the beginning to the end of life."

The control of mortality among infants and the prevention of deaths from tuberculosis, diphtheria, and other infectious diseases, have been and still are in the forefront of the public health program. But deaths from these diseases have been greatly reduced, and the major causes of present-day mortality center around the group of diseases affecting the heart, blood vessels and kidneys, cancer, pneumonias, and accidents. This shift is bringing about an increasing recognition of a change in the objectives of the public health program so that it be realigned to correspond with present conditions.

Miss Jarrett sets forth the essentials of a community program for dealing with chronic illness, and stresses the necessity for creating public recognition that prevention of chronic disease is the most pressing public health problem today. The rôle that departments of health should play in this new program, as well as the function of the voluntary agencies and how they can participate in the care of the chronic sick, are carefully examined by the author.

This study is an indispensable guide to those seeking accurate information

in the field of chronic diseases. It is only to be regretted that such excellent and authoritative source books should lack an index. SAVEL ZIMAND

Heredity and Environment — *By Gladys C. Schwesinger. New York: Macmillan,* 1933. 484 pp. Price, $4.00.

Heredity and Environment will either be considered an elementary revamping of three or four standard works, or a profound study " in the genesis of psychological characteristics," depending upon whether one is or is not familiar with the literature of psychological testing and personality measurement. Not that it is not a very useful book to one in either category—on the contrary, even the student of the field will find it a convenient summary of Pintner's *Intelligence Testing,* Symonds's *Diagnosing Personality and Character,* Hollingworth's *Vocational Psychology and Character Analysis,* and the *Twenty-seventh Year Book of the National Society for the Study of Education,* all brought up to date by the careful editing of last year's *Psychological Abstracts.*

It is an excellent textbook for courses in psychological measurement, for it is, in the main, an elaborate survey of the I.Q., its measurement, and the factors that influence it; but it is hardly, except in one portion, an adequate treatment of heredity and environment.

Why a study in genetics should devote almost two-thirds of its pages to listing measures of intelligence and personality and to summarizing superficially the viewpoints of the major schools of thought on what constitutes personality, and only about one-third (one of six chapters) to the subject of the book as indicated in the title, is difficult to see. It really consists of three distinct uncoördinated parts, and if each of these sections were published separately, only praise for the author would be in order, for two of them would be compact summaries of (1) the field of intelligence and personality measurement, and (2) the variety of viewpoints on intelligence, while the third would be a monograph on recent studies of the effects of various environmental factors on the I.Q.

On the whole, the book is a very scholarly work, but it is unfortunate that three distinct unrelated studies were bound between two covers ostensibly as one study. Each portion serves a useful purpose, but only one serves the purpose of the book. Evidence of painstaking work abounds throughout, and specific references are so numerous that reading is sometimes made difficult; more than 800 references are included in bibliographies listed after each major chapter.

MORRIS KRUGMAN

Good Eyes for Life—*By Olive Grace Henderson and Hugh Grant Rowell, M.D. New York: Appleton-Century,* 1933. 202 pp. Price, $2.00.

This volume is written in a sprightly style throughout; and its catchy phrases and the use of words in unusual meanings pique the curiosity of the reader. The names listed by the authors in their acknowledgments indicate that they had the coöperation of a number of leaders in the fields of ophthalmology and education. The quotations and the frequent references to the findings of scientific research suggest that they also have drawn upon the resources of an excellent scientific library. The well chosen collection of excerpts from scientific writings, even though presented in the Ripley, believe-it-or-not, style, leaves the reader with a sense of having been in touch with the truth.

It is in the interpretation of the facts that the reader is likely to find cause for objection. The presence of positive,

unqualified statements, as yet unsupported by authentic research, weakens the use by the authors of excerpts from scientific papers. Furthermore, flippancy, often in itself misleading, when used as a device to brighten up facts, is disappointing to one seeking information.

The authors are at their best in the material relating to the working or to the reading position for school children. It is regrettable that other sections of the book do not reach the same level, since there is genuine need for a popular presentation of scientific information on eye health. ANETTE M. PHELAN

The Chemistry of Flesh Foods and Their Losses on Cooking—*By R. A. McCance and H. L. Shipp. Medical Research Council, Special Report Series, No. 187. London: His Majesty's Stationery Office,* 1933.

This work was undertaken largely owing to the lack of adequate knowledge of the chemical composition of foods, particularly meats, and because practically all existing analyses were on uncooked foods.

In three parts, there are given a description of the analytical methods employed, results obtained on a number of different kinds of fish, shellfish, meats and poultry, and the cause and extent of losses brought about by different methods of cooking.

The analytical methods are given in such detail that they may be duplicated. The cooking methods are scantily described and some would be hard to duplicate. The degree of "doneness" is one of the most important factors affecting cooking losses, and this can be accurately controlled only by the use of well made meat thermometers and thermocouples. The authors in many cases do not record the temperatures at which the meats were cooked, which is important in affecting the shrinkage. In view of the fact that carcasses of the same animal vary one from another and that one cut varies from another of the same carcass, it would seem that accurate descriptions of the samples should accompany the analyses; also duplicate or paired cuts from the right and left sides of the same carcasses should be used, one analyzed raw, and the other after cooking.

The study is a valuable contribution to the knowledge of the composition of cooked meats and the effects of cooking. JESSIE A. CLINE

Nervous Breakdown—*By W. Béran Wolfe, M.D. New York: Farrar & Rinehart,* 1933. 240 pp. Price, $2.50.

In the judgment of many, this economic depression from which we hope we are emerging is likely to result in—or has already resulted in—an excessive number of nervous breakdowns. Hence the timeliness of a good book dealing with this subject. A discussion of causes and symptoms; a series of case histories; a summing up talk with reader—these are the essence of the book under review.

Two or three short quotations will exemplify the theory on which the author proceeds. "The pattern of any individual's life is a pattern of compensation for the inferiority feeling experienced in childhood." "The strategy of an individual's life is directed toward a goal of security, superiority and well being." He then goes on to assert that failure to make progress toward this goal results in loss of "Face" on the part of the individual, and a nervous breakdown to conceal the true state of affairs. The cure comes about by acquiring a new sense of "Face" based on service to others. A number of actual cases are analyzed to show how this works out in practice. In the course of his discussion the author strays up a side path in a long

but interesting comment on the current economic depression as it affects the inhabitants of the United States. No epithets are spared in characterizing the attitude of the average American in the face of his lost sense of security.

This book, I imagine, may be more useful as a prophylactic than as a cure. The individual whose world has not yet slipped out from under him will find many hints on how to keep a firm footing. The author's style is vigorous and colorful. There seems to be no such word as fail in his vocabulary; his cases are all cures. This, I presume, is for the psychological effect on the depressed patient. The ideal of normality held up for guidance seems to be that of the "good mixer"; or perhaps Ebeneezer Scrooge after the ghosts were through with him. The last chapter or two are not so good as the others, tending to dissipate the clearer impression of the body of the book.

All in all, an interesting treatment of a much misunderstood subject.

MERRILL E. CHAMPION

Great Men of Science—A History of Scientific Progress—*By Philipp Lenard. Translated from the Second German Edition by Dr. H. Stafford Hatfield, with a Preface by E. N. da C. Andrade. New York: Macmillan,* 1933. 389 pp. Price, $3.00.

Although the names of the author of this book and of the writer of the introduction would seem to be sufficient guarantee of the authenticity of the work, the writer of this review has taken the precaution of submitting it to a well known physicist.

While not concerned with public health, it is believed that this book should be in the library of well educated scientific men, whatever their special interests may be. A number of the discoveries of those, sketches of whose lives are here given, have been adapted not only to medical practice, but to some preventive measures, though none are directly concerned with public health. The articles concern not only those whose names are household words in all educated circles, but the author has rescued from a more or less deep oblivion the names of some who have not attained wide popularity, in spite of their contributions.

The translation seems to be excellent. The book is most readable and the illustrations, consisting almost entirely of photographs, would assure the value of the book, apart from its substance. The printing and make-up are all that could be desired, and the work can be unreservedly recommended.

MAZŸCK P. RAVENEL

Physiological Health—*School of Education Series, New York University. Edited by Jay B. Nash, Chairman, Dept. of Physical Education. New York: Barnes,* 1933. 308 pp. Price, $2.00.

Physiological Health, the fourth book in a series of five to be published on Interpretations of Physical Education, is divided into 5 parts. Each part consists of a series of papers; effort being made to contribute to the subject from several pertinent viewpoints.

Treatment in a work of this size must necessarily be somewhat brief on many points, but a group of specialists was selected well qualified to discuss the particular topics assigned, all well known in the literature for their contributions along the lines involved in the present volume.

Cross references are given by a number of the specialists. The selected bibliography in health given as Part VII has been carefully compiled and is representative of the different activities which contribute to health.

The book does not have the continuity which would prevail in a book by a single author; on the other hand, it has the merit of presenting the views

of persons who have specialized in the fields which they discuss and in which they are respectively better known than a single writer would be.

This book is within the range of the average intelligent reader and deals with 6 main topics: Health Defined, The Forces and Factors in Building and Maintaining Health, Health as a Basic Potential, Health as a Basic Potential for Full Development, Teaching for Health, and Administration for Health.

C. E. TURNER

Safety in Physical Education in Secondary Schools—*By Frank S. Lloyd. National Bureau of Casualty and Surety Underwriters. New York,* 1933. 167 pp. Price, $1.25.

This is a report on a study of the types and causes, with suggestions for prevention, of accidents occurring in the physical education program—including gymnasium work, sports, and athletics—in secondary schools.

The larger number of accidents in physical activities in the secondary schools—especially in football—has long been a cause of worry to physical educators and to school administrators.

This study, while showing a high accident rate for football, 8.75 per 1,000 exposures, shows that in proportion to the number participating the accident rate is higher in touch football, 17.11, and heavy apparatus work, 13.68; after football, the next highest rate is in lacrosse, 5.97, followed closely by wrestling, 5.71, and tumbling, 5.15.

Touch football—a supposedly innocuous sport—ranks first. Possibly this is due to the untrained condition of the players and to their lack of protective armor.

In number of days lost from classes—in proportion to number of exposures—heavy apparatus work is most hazardous, 88.0 days lost per 1,000; touch football, 81.52; wrestling, 72.44; and football 64.81.

An excellent summary of conclusions is presented and the report ends with recommendations as to means of accident prevention in this group.

This is an extremely valuable publication, particularly for those responsible for secondary school activities.

C. H. KEENE

The Teaching of Preventive Medicine in Europe—*By Carl Prausnitz. London: Oxford University Press,* 1933. 180 pp. Price, $3.75.

This volume is made up of the Heath Clark Lectures, 1932, delivered at the London School of Hygiene and Tropical Medicine. It is based largely on personal observations by the author, supplemented by documents of the Health Section of the League of Nations. It is to be regretted that there are no reports from Belgium, Italy, the Netherlands, or the Scandinavian countries, all of which are doing very good work in the teaching of preventive medicine.

The book is a valuable contribution to our knowledge of the subject treated. Perhaps the most interesting chapter is the introduction of some 28 pages, in which are discussions of unemployment, malnutrition, etc., the only objection to which is that the data presented are not quite up-to-date. The author gives an excellent aphorism—"The greenhouse of civilization brings forth not only sweet fruits and beautiful flowers, but also poisonous weeds." He also brings forward an unanswerable argument in his statement that to advance preventive medicine is to the interest of the state, hence it is obvious that the state must do all in its power to stimulate and assist research by founding and maintaining adequate institutions of hygiene. As a fact, all enlightened countries now have such institutes which are being steadily improved and added to. There is a description of the teaching of preventive medicine in the various countries visited by the author,

with a fairly complete outline of what is being done, illustrated by some excellent photographs of buildings, laboratories, and lecture halls.

Practically all of these institutes are under state control and supported by the state, and the great majority of them were erected by aid from the Rockefeller Foundation. The volume ends with a chapter on the work of the League of Nations.

The value of the book would have been much increased for the average reader who has not been able to visit the countries and the institutes mentioned if the author had given a more extensive critical comparison of them.

The book is excellently printed and made up. MAZÝCK P. RAVENEL

Our Common Enemy: Colds—*By the Editors of "Fortune" in Consultation with Eminent Physicians. New York: McBride,* 1934. Price, $1.00.

Every once in so often a layman breaks into print on a medical subject, and, as a rule, makes a mess of it. This time the editors of Fortune have tackled one of the least understood and most difficult problems in medicine. The only conclusion that can be arrived at from their statements is, what all doctors have been aware of for a long time, that we know very little about the common cold.

The authors claim to have been in consultation with eminent physicians, whom they are very fond of speaking of as "No. 1," so and so. They have left out of consideration entirely perhaps the most monumental work on colds which has yet been published. As editors supposedly interested in good English, the authors should have avoided the use of "flu" for influenza. There is no such word to be found in either English or medical dictionaries.

The really useful part of this book is Part II, "The Cold Business," in which the various nostrums and quackeries are treated in a masterly manner, which ought to be a lesson to the public, though it will not.

The illustrations of germs which are found in colds, following page 47, are worse than useless. The book is well printed and is entertaining.

MAZÝCK P. RAVENEL

REPORTS

New Zealand—The report of the Director-General of Health of New Zealand for the year ended March 31, 1933, indicates progress in health activities as evidenced by declining death, infant mortality and morbidity rates. The 1932 death rate was 8.02 per 1,000 mean population, the lowest ever recorded in New Zealand. The birth rate was 17.09 and the infant mortality rate, 31.22 per 1,000 live births. With the exception of a minor epidemic of acute poliomyelitis (148 cases and 19 deaths), infectious diseases were generally marked by a distinct fall in incidence.

During the past 7 years individual records and histories of all persons treated for cancer in the public hospitals in the Dominion have been maintained by the Census and Statistics Office. There have been nearly 2,000 cases analyzed annually. These data have been published by the Government Statistician in the *Monthly Abstract of Statistics* during 1932. The method of keeping records has been standardized and brought into conformity in the four centers, and a follow-up system for cases which have left the hospital has also been developed.

Special attention has been given to

the question of malnutrition among school children. The conclusions drawn from an analysis of the 60,000 to 70,000 annual examinations over a 6-year period indicate that over the Dominion as a whole the nutrition of school children has been well maintained, although there is some evidence that a group of city children is showing clinical signs of malnutrition due to the economic depression. Measured by mortality and morbidity rates, the economic crisis has not yet shown any serious detrimental effect on the public health, nor has there been any increase in the proportion of in-patients treated in public hospitals.

Nashoba Health District, Mass.—The first annual report of the Nashoba associated boards of health gives a list of members of the board during the past year on the title page. The 14 towns comprising the District have been assisted by the Commonwealth Fund and the State Department of Public Health. Each town has 3 members on the board, which meets 4 times a year in the different towns in alphabetical rotation. The Executive Committee, composed of one member from each local board, meets monthly. The Health Unit is that group of trained personnel hired by and responsible to the Nashoba Associated Boards of Health. Additional services have been established in the control of communicable disease, nursing, laboratory, and sanitation. Records, reports, and vital statistics for the entire area are centralized in the Unit's office.

Professional advancement to physicians and nurses in the district through medical and nursing institutes and through fellowships for post-graduate study at recognized schools is another feature of the newly established program. The immediate effect of these new services developed by the Health Unit is evidenced in the increased rating of public health activities in the District, as measured by the *Appraisal Form for Rural Health Work*, from 367 points in 1930 to 598 points in 1932, or an increase of 63 per cent.

Madison County Health Unit, Kentucky—The report of this Unit for the fiscal year ending July 1, 1932, indicates that tuberculosis is one of the outstanding causes of death in the county. Consequently a vigorous educational campaign and a systematic canvass of contacts of tuberculosis cases within a 3-year period were undertaken. Every person in the family of an active case was urged to have a physical examination, a tuberculin test, and, if indicated, an X-ray of the lungs.

Three venereal disease clinics were held weekly by the department, where 1,072 people were examined over 12 months, 55 per cent of the patients under supervision being colored. The work of the 19 midwives practising in the county (7 colored and 12 white) was supervised. More than 100 babies were delivered by midwives in 1931.

This is practically a descriptive account of the health department activities, without tabular statistical material, but attractively illustrated by a number of pictures. A noteworthy feature of this Health Unit program is the systematic organization of lay and professional committees.

Gibson County, Tenn.—Gibson County had an estimated population of 47,109 as of January 1, 1933, with 21 per cent of its people colored, and less than 1 per cent foreign born. The county, located in the western part of the state, is essentially agricultural and is said to be the second in the United States in the diversification of crops. There are 8 incorporated towns in the county, with a total population of about 12,000, no town having over 5,000 people according to the 1930 census.

The school enrollment in the 76 white and 31 colored schools is 10,000.

In 1930 the Commonwealth Fund subsidized the health department with the understanding that the county would gradually take over the entire cost of the work. In addition, the Fund has awarded study fellowships to physicians in the county.

Since 1930 the department has doubled its personnel. Approximately 50 per cent of the expectant mothers in the county have been under nursing care during the past 3 years. An attempt is made annually to examine all school children in the 1st, 3rd, 5th, and 7th grades.

The report of 23 pages is interspersed with interesting full-page photographs of various phases of health department activities.

Dayton, Ohio—A summary of health activities during 1933 appears in the January, 1934, bulletin of the health department, and indicates a birth rate of 15.2, a death rate of 11.7 per 1,000 population (9.9 corrected for residence), and an infant mortality rate of 48.8 per 1,000 live births. There were no deaths from typhoid fever or smallpox. A 60 per cent increase was noted in deaths from tuberculosis "as a result of the depression."

The results of a survey made in 5 schools to determine the amount of undernourishment among relief cases showed that the children of many families not on relief are suffering more from straitened circumstances than are those who are. An anti-diphtheria campaign was undertaken with the result that approximately 1,000 children under 2 years of age have been immunized during the year. In 1933 there were 150 cases and 8 deaths from this disease, as compared with 176 cases and 16 deaths in 1932.

The hope is expressed that in the future the statement that "every physician's private office will become a health center" may be a reality; that immunizations against diphtheria, smallpox, and scarlet fever, as well as general physical examinations, treatment of a majority of the indigent sick, examination of children for school attendance, etc., may be conducted in the offices of private physicians. The city will assist in financing cases where the patient is unable to pay in full for treatment.

ABSTRACTS FROM RECENT FOREIGN SOURCES

CHILD WELFARE PROVISIONS OF THE SOCIAL WELFARE LAW OF 1933 IN DENMARK

Introductory statement—The social-welfare law of Denmark of 1933 is a codification of the social welfare and child welfare laws of that country. Several chapters of this law are devoted to child welfare. While previously the child welfare regulations were scattered in a number of laws and were administered by different bodies, the new law, superseding and amending the previous legislation, has consolidated practically all child welfare measures and has unified their administration.

Administration of the child welfare provisions—In every commune, except Copenhagen, the child welfare work is to be performed by a social welfare committee (Social Udvalg) through a sub-committee on child welfare (Underudvalg) containing persons who are not necessarily members of the local government, but who must be well qualified for child welfare work. In Copenhagen there is to be a special child welfare board (Børnenaevn). This concentration of all child welfare work in one local body and the emphasis on qualifications rather than

on membership in the local government are innovations in the present law.

The child welfare work of all the communal social welfare committees is supervised by the National Board of Child Welfare (Landsnaevnet for Børneforsorg) consisting of 5 members, one of whom is the Chief Inspector of Child Welfare. The Board also passes final judgment on appeals against the decisions of the communal committees.

The Chief Inspector of Child Welfare, assisted by a number of inspectors, has general charge of child welfare work. Among other things he must inspect personally at least once a year the institutions for children; the inspectors must visit at least twice a year all the foster homes and institutions.

Extent of child welfare work under the new law—Under the new law the following branches of child welfare work will be conducted by the communal social welfare committees:

1. Supervision over children under 14 brought up outside of their own homes, all illegitimate children under 7, children under 18 residing with parents who receive aid from public funds
2. Preventive care of children residing with their parents or guardians, but lacking proper care or presenting problems of behavior
3. Supervision over children removed from their homes because they present problems of character or behavior or because they were mistreated by their parents or guardians
4. Care of juvenile delinquents who are not prosecuted or whose penalties have been remitted
5. Widows' and widowers' pensions
6. Public aid to children
7. Feeding of children in public schools
8. Maternity aid from public funds—

Lovtidende (official collection of laws of Denmark), Copenhagen, 1933, No. 28, and volumes for 1911, 1920, and 1928. *Socialt Tidsskrift*, Copenhagen, 1933, vol. 9, No. 4. Translator's comment.

A SELECTED PUBLIC HEALTH BIBLIOGRAPHY WITH ANNOTATIONS

Social Hygiene Marches On—How the various state and local health department venereal disease bureaus and non-official social hygiene associations survived or failed to survive the stormy days of the fourth year of hard times is recounted in bald detail. And the account is far from discouraging.

ANON. Inventory for 1933. J. Social Hyg. 20, 2:53 (Feb.), 1934.

Graded Milk Ordinance Enforcement—Cities which have enacted the standard (U.S.P.H.S.) milk ordinance and enforced it with sufficient thoroughness to achieve a rating of 90 per cent or better are listed. The purposes of the listing are to encourage cities in well doing and provide travelers with the names of places where they may drink milk without misgivings.

ANON. Milk Sanitation Ratings of Cities. Pub. Health Rep. 49, 4:111 (Jan. 26), 1934.

British Eugenic Sterilization Study—There is no ground for alarmist views of racial deterioration; no way to separate sharply dullness and mental defect; no scientific value in the Kallekak and Jukes chronicles; no evidence that sterilization of certified feeble-minded of previous generations would have affected incidence of mental defect in this; no evidence of excessive fertility in feeble-minded; no substitute for institutional care. On the other hand: two-thirds of all defectives are capable of community life; defectives make inefficient parents. The committee of the B.M.A. doubts the wisdom of compulsory sterilization, but if voluntary sterilization is to be enforced,

elaborate, and adequate safeguards are proposed.

ANON. Sterilization of Defectives. Brit. M. J. 3812:161 (Jan. 27), 1934.

Communicable Disease and the Nurse—"The modern health officer adapts his control measures to fit the epidemiological characteristics of each disease. . . . Just as the manner of the attack varies with the peculiarities of the several diseases, so will the rôle of the public health nurse be dependent upon those special characteristics of the disease which lend themselves to the nursing approach."

ANDERSON, G. W. The Rôle of the Public Health Nurse in Communicable Disease Control. Pub. Health Nurs. 26, 2:66 (Feb.), 1934.

Pasteurizing Canadian Milk—Almost everything that can be said about the pasteurization of milk will be found in this series of Canadian papers. The discussion, which is inclusive though not particularly new, covers milk-borne diseases, relative nutritional values, ordinances, supervision of pasteurization, and defects to be found in the plants.

BELL, W. J., *et al.* Safe Milk (etc.). Canad. Pub. H. J. 25, 1:1 (Jan.), 1934.

Business-like Epidemiology—How the Chicago Department of Health went about tracing down and showing up cases in the amebic dysentery outbreak (totaling 721 cases in 206 towns) is graphically recounted. A thorough and important committee report implicating cross connections is appended.

BUNDESEN, H. N., *et al.* The Outbreak of Amebiasis in Chicago During 1933. J.A.M.A. 102, 5:367 (Feb. 3), 1934.

Does the "Modern Pace" Kill?—If death rates in circulatory and renal conditions are studied as a whole, increases after the fifth decade are slight and have mounted little since 1910. Rates for infectious diseases have fallen in every age group. If circulatory and infectious rates are added, the combined death rate tends to attain equilibrium. The theory that "stress and strain" accounts for present day cardiac death rates is not supported, for the rise in circulatory diseases depends on the fall in the infectious diseases, not in early life, as often assumed, but in the very decades in which circulatory increase occurs.

COHN, A. E., and LINGG, C. Heart Disease from the Point of View of the Public Health. Am. Heart J. 9, 3:283 (Feb.), 1934.

Children of Tuberculous Parents—Tuberculosis mortality, 15–39 years, was two or three times as high among the offspring of white tuberculous parents as in a control group. Removal of the ill parent or carelessness in the home seemed to be of little importance.

EVARTS, H. W., *et al.* Tuberculosis Among the Children of Tuberculous Parents. Am. Rev. Tuberc. 29, 2:123 (Feb.), 1934.

About Children's Sleeping Habits—Warm milk at bedtime induces quiet sleep in children; other beverages have no consistent effect. Large amounts of food at bedtime result in marked restlessness. Baths seem to have no constant effect. Children have definite sleep patterns; they are quieter in cold weather than in hot.

GIDDINGS, G. Normal Sleep Pattern for Children. J.A.M.A. 102, 7:525 (Feb. 17), 1934.

Difficulties in Dealing With Amebic Dysentery—Some of the uncertainties about the late Chicago amebic dysentery cases are presented to round out the picture of the outbreak's epidemiology. Even as to hand washing by food handlers the question is raised: "It remains to be seen whether any considerable number of individuals can be made sufficiently conscious of the possible menace to others to render this measure effective."

McCoy, G. W. Amebic Dysentery. Pub. Health Rep. 49, 5:141 (Feb. 2), 1934.

Preventing Congenital Syphilis—Antenatal treatment of pregnant syphilitic patients reduces fetal deaths and syphilitic infants strikingly; results are proportionate to treatments given; even a few treatments will materially alter the outcome.

McKelvey, J. L., and Turner, T. B. Syphilis and Pregnancy. J.A.M.A. 102, 7: 503 (Feb. 17), 1934.

Putting Taste-Appeal in the British Diet—"If we imagine that there is great need for economy in the family budget, we even suggest bloaters, full of body-building material, for dinner. No doubt they are, but how many people like bloaters. To the man in the street the bloater is a joke, not a food. . . . I have personally tried some of the cheap daily dietaries advocated for diminished family budgets. I did not enjoy the experiment."

Murray, J. O. The Public Health Outlook in Nutrition. Pub. Health. 47, 5:162 (Feb.), 1934.

Depression Health De-bunked—In three more cities the new-poor were found to be suffering from diseases greatly in excess of the rate of the still-independents, and of their own rates while they still "had it." "It can be said," concludes the paper, "that none of the beneficent effects often attributed to the economic depression are evidenced by the data. On the contrary, illness has not been most frequent among those who have had to 'tighten their belts' most."

Perrott, G. St. J. and Collins, S. D. Sickness and the Depression. Milbank Quart. Bull. 12, 1:28 (Jan.), 1934.

Streptococci in Colds and Influenza—Streptococci and pneumococci isolated in studies of colds, influenza, and pneumonia have distinctive curves of catophoretic velocity. Convalescent serum from colds and influenza cases slows the catophoretic time of the respective streptococci and this (corresponding with the specific antibody action) indicates the close relationship of streptococci from colds and influenza and that they have etiologic significance.

Rosenow, E. C. Catophoretic Time and Velocity of Streptococci and Pneumococci. J. Infect. Dis. 54, 1:91 (Jan.-Feb.), 1934.

For Gassed Sewage Works Employees—Victims of carbon monoxide poisoning in sewers or sewage treatment plants, if suffocated, should be given prone pressure resuscitation, warmed, stimulated with coffee or hypos, given complete rest, and for 20 or 30 minutes given oxygen and carbon dioxide. Plants should be equipped with the appropriate apparatus.

Sayers, R. R. Gas Hazards in Sewers and Sewage Treatment Plants. Pub. Health Rep. 49, 5:145 (Feb. 2), 1934.

Reducing the Tax of Tuberculosis—In this editorial, Professor Winslow develops a telling conception of health economics which other sanitarians might well put to other good uses; upon the subject of reduction of taxes, he recounts the lowering of the tax of tuberculosis on humanity. Similar pictures might be drawn of the tax of typhoid, the tax of diphtheria, etc.

Winslow, C.-E. A. One Way to Reduce Taxes. Pub. Health Nurs. 26, 3:119 (Mar.), 1934.

More Typhoid Carriers—How each epidemic of typhoid fever creates a new crop of carriers and establishes the possibilities of food-borne infections is brought home to the water works operator.

Wolpert, N. W. The Typhoid Carrier Problem. Water Works Engineering. 87, 4:160 (Feb. 21), 1934.

BOOKS RECEIVED

MODERN SEWAGE TREATMENT. By T. P. Francis. London: The Contractors' Record, 1932. 322 pp. Price, $7.50.

ASTHMA, HAY FEVER AND RELATED DISORDERS. By Samuel M. Feinberg. Philadelphia: Lea & Febiger, 1933. 124 pp. Price, $1.50.

KEEPING A SOUND MIND. By John J. B. Morgan. New York: Macmillan, 1934. 440 pp. Price, $2.00.

I KNOW JUST THE THING FOR THAT! By J. F. Montague. New York: Day, 1934. 265 pp. Price, $2.00.

A HEALTH PROGRAM FOR THE CHILDREN OF A COUNTY. By Thomas Gordon Bennett. New York: Teachers College, 1933. 196 pp. Price, $2.00.

CHINESE MEDICINE. By William R. Morse. New York: Hoeber, 1934. 185 pp. Price, $1.50.

HAPPY HEALTH STORIES. By Mildred H. Comfort. Chicago: Beckley-Cardy, 1934. 160 pp. Price, $.70.

STAND UP AND SLIM DOWN. By Ettie A. Hornibrook. New York: Doubleday, 1934. 167 pp. Price, $1.95.

THE HARVEY LECTURES, 1932–1933. Various authors. Baltimore: Williams & Wilkins, 1934. 233 pp. Price, $4.00.

NEWS FROM THE FIELD

TRAINING COURSE FOR HEALTH OFFICERS

THE University of California, in its Intersession and Summer Session of 1934, will offer 12 weeks of intensive training for health officers. The session opens May 14 and closes August 3. The course is open to any person with the degree of doctor of medicine, but because of the nature of the work the class will be limited in number.

The first 6 weeks of the course will be conducted in Berkeley, Calif., under the general direction of Dr. Frank L. Kelly, F.A.P.H.A., and will consist of class instruction, group discussions, and field demonstrations. The next 4 weeks will be spent in the San Joaquin County Health Unit. During this period each student will receive practical field experience under the supervision of Dr. John J. Sippy, F.A.P.H.A. In the last 2 weeks each student will be required to make a survey of the health work in a community near to Berkeley.

The regular fees of the Intersession and Summer Session of $35.00 for each session will be charged. There will be no laboratory fees.

Applications for admission should be sent to Dr. John N. Force, Chairman, Department of Hygiene, University of California, Berkeley, Calif., and should be accompanied by a statement of professional training and experience. Those wishing to attend should make application as early as possible.

DR. CAMPBELL GIVES SALMON MEMORIAL LECTURES

THE 1934 series of Salmon Memorial Lectures will be delivered by Dr. Charles Macfie Campbell, Professor of Psychiatry at Harvard Medical School, Harvard University, and Medical Director of the Boston Psychopathic Hospital. The subjects are announced as follows: Lecture 1, "Trends in Psychiatry," Lecture 2, "Classification vs. Dynamic Analysis," Lecture 3, "Conclusions and Suggestions." The lectures will be given at the New York Academy of Medicine, 2 East 103 Street, New York, on April 13, 20, and 27.

MARYLAND COUNTY HEALTH SERVICE

DR. R. H. RILEY, Director of the Maryland State Department of Health, advises that Caroline County,

Md., has now provided full-time county health service, giving the state a 100 per cent county health service.

Allegany County went on a full-time basis in 1922, and has the honor of being the first to organize such service. With the full coöperation of the county authorities, one after another of the 23 counties has been added to the list. The development by counties has been as follows:

1922—Allegany; 1923—Montgomery; 1924—Frederick, Baltimore, Calvert, and Carroll; 1927—Prince George's, and Talbot; 1928—Harford; 1929—Cecil, and Wicomico; 1930—Kent, Washington, and Anne Arundel; 1931—Garrett, Dorchester, Queen Anne's, and Worcester; 1932—St. Mary's, Charles, Somerset and Howard; 1934—Caroline.

In addition to being responsible for the health service of Anne Arundel County, the unit for that county is used as a training center and furnishes opportunities for field work for students in public health administration.

COMMITTEE ON CHILD WELFARE LEGISLATION

A COMMITTEE to study child welfare laws and to draft a bill on child welfare was recently appointed by the President of Uruguay. The committee consists of 8 members. Most of them are physicians who have been active for many years in child welfare work.—*Diario Oficial,* Montevideo, 1933. No. 8014.

LILLIAN D. WALD'S BIRTHDAY

ON the 10th of March Miss Lillian D. Wald celebrated her 67th birthday, and a group of children from the lower East Side of New York City broadcast their songs to her in Westport, Conn., from radio station WEVD.

Until she moved to the country for her health a year ago, Miss Wald had spent forty years as a neighbor of these children, their parents, and their grandparents on Henry Street. She founded the Henry Street Settlement in 1893. The children sang under the direction of Mrs. Hedi Katz, head of the Music School of Henry Street Settlement. An interesting gift for Miss Wald was a specially bound volume containing Italian, Russian, and Jewish folk songs of New York's East Side, gathered and written for the first time under the supervision of Mrs. Martha Ramsey.

NURSES' 1934 BIENNIAL CONVENTION WASHINGTON, D. C., APRIL 22–27

THE American Nurses' Association, the National League of Nursing Education, and the National Organization of Public Health Nursing, will all have separate sessions as well as joint meetings of all three.

The *A. N. A. Bulletin* for March, 1934, gives the tentative programs of the A.N.A. and the N.L.N.E., and *Public Health Nursing* for April gives the program of the N.O.P.H.N.

These are the hotels to be occupied as headquarters during the Biennial Convention:

MAYFLOWER—American Nurses' Association.
WILLARD—National League of Nursing Education.
WASHINGTON—National Organization for Public Health Nursing.
WARDMAN PARK—Student Nurses.
POWHATAN—Exhibitors.

For further information, write to the American Nurses' Association, 50 W. 50th Street, New York.

OCCUPATIONAL DISEASE CLINIC

NEW YORK University and Bellevue Hospital Medical College recently opened a special clinic for occupational diseases, with a laboratory equipped for the work. Cases of lead poisoning, silicosis, occupational dermatoses, and benzene poisoning are among the cases being handled in the clinic, which meets Wednesday afternoons. Physicians and industrial health workers have been invited to refer cases.

WASHINGTON STATE HOLDS PUBLIC HEALTH INSTITUTE

A PUBLIC health institute is to be held under the auspices of the Washington State Department of Public Health at the State College of Washington, Pullman, Wash., on May 4–5. It is expected that a permanent organization of public health workers will be effected, possibly to be known as the Washington State Public Health Association.

CAN YOU PROVE IT?

BACHELORS and maids, fathers and mothers, alike received a little blue slip distributed for New Mexico's Bureau of Public Health by the State Comptroller's office with license plates for automobiles. Thus the reaching of a considerable proportion of the state's population was secured at the cost of printing some 60,000 small slips. Our correspondent reports:

As you may imagine, Miss Tober, state registrar, has had some quite amusing replies from the bachelors of the state.

Here is the copy (8 pp.):

Attention, Fathers and Mothers! Your automobile is now legally registered. You can prove its age and ownership. Can you do the same in regard to your baby?

If you are not certain that your baby's birth is registered write to the State Registrar, Bureau of Public Health, Box 711, Santa Fe, New Mexico, for this information.

PERSONALS

DR. HOWARD MORROW, of San Francisco, Calif., member A.P.H.A., has been appointed President of the California State Board of Health, succeeding Dr. John H. Graves.

DR. BERNARD W. CAREY, of Detroit, Mich., F.A.P.H.A., medical director of the Children's Fund of Michigan, was elected President of the Michigan Public Health Association at its last annual meeting, succeeding Dr. William J. V. Deacon, of the State Department of Health, also Fellow A.P.H.A.

CONFERENCES

April 16–17, Eighth Annual Meeting of the Florida Section of the American Water Works Association, Daytona Beach, Fla.

April 16–20, Eighteenth Annual Clinical Session of the American College of Physicians, Chicago, Ill.

April 22–27, Nurses' 1934 Biennial Convention. American Nurses' Association, National Organization for Public Health Nursing, and National League of Nursing Education. Washington, D. C.

April 26, A Hearing on the Problems of Cancer, under the auspices of the New York City Cancer Committee, New York, N. Y.

May 1–6, National Conference on Fundamental Problems in Negro Education, Washington, D. C.

May 14–17, 30th Annual Meeting of the National Tuberculosis Association, Cincinnati, Ohio.

May 15–20, Meeting of Royal Sanitary Institute, Norwich, England.

May 26–29, Annual Meeting of American Association on Mental Deficiency, New York, N. Y.

June 4–8, Annual Convention of the American Water Works Association, Hotel Commodore, New York, N. Y.

June 11–13, Twenty-third Annual Meeting of the Canadian Public Health Association, Montreal, Que., Canada.

June 25–27, Annual Conference of Health Officers and Public Health Nurses, together with American Association of School Physicians, Saratoga Springs, N. Y.

June 25–30, Annual Meeting of the American Home Economics Association, New York, N. Y.

July 9–14, Health Congress, to be held under auspices of the Royal Sanitary Institute, Bristol, England.

August 6–10, Annual Meeting of the American Dental Association, St. Paul, Minn.